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Agriculture

Forest  
Service

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# ENVIRONMENTAL ASSESSMENT

Bradwell Game Farm Analysis Area

Apalachicola Ranger District, Apalachicola National Forest  
Liberty County, Florida



Photo by Renee Ripley

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## SUMMARY

The Apalachicola National Forest is proposing several actions in Compartment 113 of the Apalachicola National Forest, Apalachicola Ranger District in Liberty County, Florida.

The proposed actions include timber harvest related to historical restoration by clearcutting 21 acres that were formerly wildlife openings, and planting these areas to native groundcover. Habitat improvement for the gopher tortoise (*Gopherus polyphemus*) and its commensals by: Row thinning approximately 108 acres of pine plantations, ecosystem restoration of 40 acres of “off-site” slash pine by clearcutting and re-planting to longleaf pine; Removal cut and biomass removal of 27 acres of loblolly, laurel oak, and sparkleberry and planting to longleaf, and thinning 111 acres of immature slash and loblolly pine stands. Actions connected to the proposed timber harvest include site preparation for tree planting using the herbicides triclopyr and or hexazinone, using and maintaining approximately 1.5 miles of forest roads, performing reconstruction work on approximately 2.7 miles of forest roads and 0.2 miles of temporary roads, and creating log landings. All of the proposed actions, if approved, would occur within the next 5 to 7 years.

The proposed actions are designed to restore and interpret the area to early 1900’s era conditions, improve gopher tortoise habitat, improve forest health and sustainability, and to implement the direction of the forest plan. The proposed actions are needed to move toward the desired future conditions set forth in the National Forests in Florida Revised Land and Resource Management (Forest) Plan 1999.

In addition to the proposed action, the Forest Service also evaluated the following alternatives:

- An alternative that does not utilize herbicides. This alternative offered hand tool methods of accomplishing the restoration tasks.
- The no action alternative in which only normal operations would continue such as prescribed burning for fuel reduction and road maintenance.

Based upon the effects of the alternatives, the responsible official would decide whether or not to restore and interpret the area to early 1900’s era conditions, improve gopher tortoise habitat, improve forest health and sustainability, and to implement the direction of the forest plan within the Bradwell Game Farm Analysis Area. If a decision is made to improve this habitat then additional decisions must be made on the methods that would be utilized to make these improvements and their connected actions, such as chemical site preparation verses hand tool site preparation, road reconstruction, and road closure.

# INTRODUCTION

## Document Structure ---

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four parts:

**Introduction:** The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

**Comparison of Alternatives, including the Proposed Action:** This section provides a more detailed description of the agencies proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised internally by Forest Service employees, the public or other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table to compare the differences between alternatives.

**Environmental Consequences:** This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by environmental components. Within each section, the affected environment is described first, followed by the effects of each alternative. The No Action Alternative provides a baseline for evaluation and comparison of the other alternatives.

**Agencies and Persons Consulted:** This section provides a list of preparers and agencies consulted during the development of the environmental assessment.

**Appendices:** The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Apalachicola Ranger District Office in Bristol, FL.

## Background ---

The Bradwell Game Farm analysis area is within Forest Plan Management Area 3.1 (Special interest area).

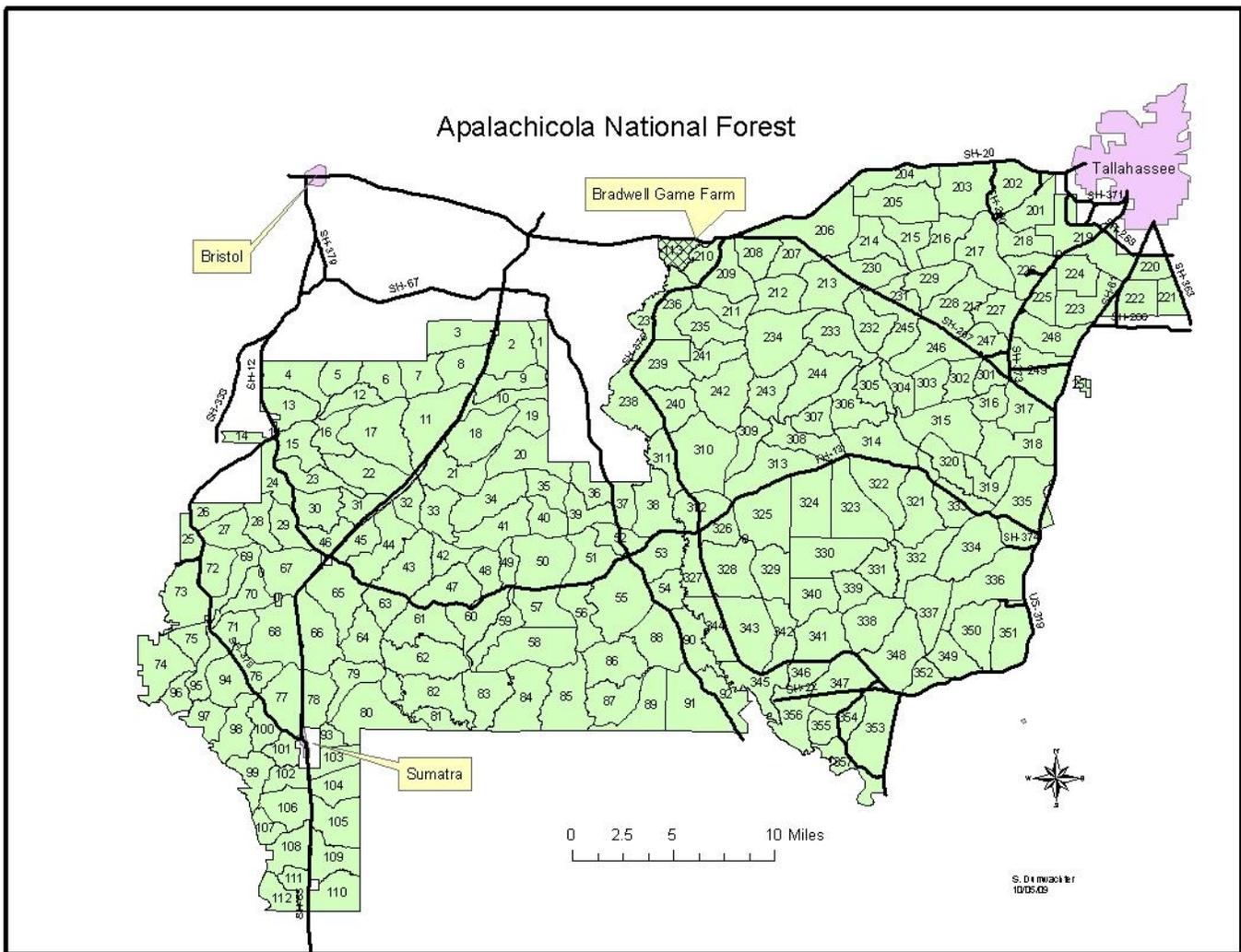
This tract is very important for local history and has significance in the history of North Florida as well. The game farm was in use in the early 1920's and 1930's, during which time senators and congressmen, movie stars and other affluent people, came to hunt and relax (personal communication, Malcolm Blount). There are several historical structures still remaining on the property, including a cabin, wildlife pens, a pet cemetery, and hunting blinds.

During its' heyday, wildlife openings were scattered throughout the property. They were planted with peas for the wildlife. Later these fields were planted with loblolly pine, some in 1970 and the rest in 1982. Slash pine

plantations were planted on the north end of the compartment in 1987. Vegetation conditions prior to plantation establishment included more longleaf pine growing under more open conditions with greater diversity of grasses and forbs than under current conditions. Stands 2, 9, and 31 were cut over and not replanted, and are overgrown with laurel oak, sparse loblolly, and sparkleberry.

There are two Threatened, Endangered or Sensitive species in the area. These include the nesting site of a bald eagle (recently delisted, but is still protected under the Bald and Golden Eagle Protection Act) and a declining population of gopher tortoise (state listed threatened, under review for federal listing). The eagle nest will not be affected by any of the proposed actions.

Figure 1. Vicinity Map



## Purpose & Need for Action

The purpose of the proposed actions is to restore and interpret the area to early 1900's era conditions, improve gopher tortoise habitat, and improve forest health and sustainability. The proposed actions are needed to move toward the desired future conditions set forth in the National Forests in Florida Revised Land and Resource

Management (Forest) Plan 1999. The Bradwell Game Farm is an important piece of history for eastern Liberty County. There are many colorful local stories and legends about the tract and its previous owners. As it is part of the National Forest system of this country, a balance must be struck between protecting, preserving, and interpreting the cultural resources of the property with healthy forest and ecosystem management. Three historic wildlife openings will be restored, with protection of historic fencing a priority. A mixed use hiking trail will be established, with kiosks at interpretive sites.

This area is part of an initiative to reintroduce the eastern indigo snake. The indigo snake is dependant upon gopher tortoise burrows for refuge from extreme temperatures, especially cold temperatures in the winter months. This project would improve gopher tortoise habitat, provide protection from predation, and establish a monitoring plan. Ground cover restoration will be prioritized in areas that have gopher tortoises.

The Forest Service is proposing to row thin approximately 108 acres of young slash pine plantations. Past forest management practices have established several pine plantations in the analysis area. These plantations have a high tree density. Without thinning, the growth rate of the trees would begin to diminish, increasing the time before these stands can be considered good habitat.

In another part of the analysis area past forest management practices have resulted in some slash pine plantations being planted on dry sites that would normally support longleaf pine trees. These dry sites are low in nutrients and have a low water supply. Slash pine grows much better on wet sites. Slash pine also has lateral roots to help stabilize the tree in wet sites. Longleaf pine has a taproot that usually grows straight down to the water table. All of these adaptations are related to the site or condition the trees evolved around. When trees are planted in conditions where they don't normally grow and survive they are considered "off-site" and generally do not grow as well.

The Forest Service is proposing to restore longleaf pine on approximately 40 acres of "off-site" slash pine plantation and 27 acres of sparse loblolly, laurel oak, and sparkleberry. Restoration includes removing the existing off-site species, site preparation with herbicides for reintroduction of native species, supplementing the ground cover by planting or seeding native groundcover and then finally planting longleaf pine seedlings to reforest the site. Restoring the proper tree species and ground cover in the long run would create gopher tortoise habitat for the future.

Secondary purposes served by the proposal include improving forest health. Thinning 111 acres of overstocked loblolly pine stands would keep the trees growing vigorously. In stand 19, bottomland hardwood would be favored over the loblolly pine as a leave tree, to move toward a loblolly and bottomland hardwood stand. Research has shown that trees that are growing vigorously are less likely to be attacked by insects and therefore less likely to host epidemic insect populations. Prescribed burning young longleaf stands would reduce the chance of the common brownspot disease by reducing dead pine needles that host the fungus.

"The Forest Service recognizes that a healthy forest has periodic outbreaks of insects and diseases." ([US Forest Service 1999, page 3-8](#)). Past forest type conversions from longleaf to slash and loblolly pine exacerbate the situation because longleaf is generally more resistant to insects and disease. Loblolly and slash pine plantations are of particular concern on the Apalachicola National Forest because these species were frequently planted on longleaf sites. Plantations also tend to have high tree densities. The primary insects and diseases of concern include southern pine beetle, IPS engraving beetle, pine sawyer beetle, fusiform rust, and brownspot fungus. This area has had outbreaks of southern pine beetle in the past.

“Safe, environmentally appropriate roads” are necessary for both resource management and public use (US Forest Service 1999, page 3-7). This project provides an opportunity to reconstruct and maintain existing system roads, and especially to reduce the hydrological impacts of roads (US Forest Service 1999, page 3-5, IN-1).

The proposed actions also respond to the goals and objectives outlined in the National Forests in Florida Forest Plan, and helps move the project area towards desired conditions described in that plan (US Forest Service 1999).

The alternatives to the proposed action were developed utilizing the issues, concerns, and opportunities identified through public and internal scoping, and are consistent with the goals and objectives of the Revised Forest Resource and Management Plan for the National Forests in Florida (US Forest Service 1999, pages 2-3 to 2-7). The forestwide goals and objectives utilized in developing the alternatives are listed below:

### **Forestwide Goals**

2. Be aggressive and innovative in providing for public participation in planning, managing, and monitoring of the national forests.
5. Contribute to the social and economic well being of local communities by promoting sustainable use of renewable natural resources and participating in efforts to devise creative solutions for economic health.
6. Maintain or, where necessary, restore ecosystem composition, structure, and function within the natural range of variability in all ecosystems, with emphasis on longleaf pine-wiregrass, sand pine-oak scrub, pine flatwoods, hardwood/cypress, oak hammock ecosystems, and other imperiled specialized communities.
7. Manage floodplains, groundwater, lakes, riparian areas, springs, streams, and wetlands to protect or enhance their individual values and ecological functions.
8. Conserve and protect important elements of diversity such as endangered and threatened species habitat, declining natural communities, and uncommon biological, ecological, or geological sites.
9. Manage for habitat conditions to recover and sustain viable populations of all native species, with special emphasis on rare species.
10. Apply prescribed burning technology as a primary tool for restoring fire's historic role in ecosystems.
17. Preserve significant heritage resources as remnants of our cultural heritage by locating, evaluating, and protecting heritage resource sites.
19. Protect, enhance, and, where necessary, restore the forests' scenery resource values.

### **Forestwide Objectives**

3. Restore between 10,000 and 15,000 acres of off-site slash pine to the appropriate native vegetation in the next 10 years. Remove slash pine from 8,000 acres of mixed longleaf/slash pine stands on the Osceola NF. The long-term objective is to restore all the off-site slash pine to the appropriate native vegetation.
4. Prescribed burn on average every 3 years with varied intervals on any given site to restore natural processes in all sites where the natural-fire-return interval was less than 10 years. Strive to burn 50 percent of those acres

between March 15 and September 30 and 20 percent between May 1 and July 31. This includes wilderness, wilderness study areas, and the Savannah research natural area.

5. Thin 45,000 to 55,000 acres of longleaf and slash pine stands to release overcrowded live crowns, favor appropriate pine species regeneration, increase stand growth, allow more sunlight onto the forest floor, and increase suitable habitat for red-cockaded woodpeckers (RCWs).

20. Designate the following acres of future old growth by community type.

**Table 2.1 Old-Growth community Objectives**

<b>Old-Growth Community</b>	<b>Acres</b>
Upland Longleaf Pine Forest	10,200
Southern Wet Pine Forest, Woodland, and Savannah	11,000
Cypress/Tupelo Swamp Forest	17,700
River Floodplain Hardwood Forest	2,900
Hardwood Wetland Forest	24,200
Dry and Dry Mesic Oak/Pine Forest	2,200
Coastal Plain Upland Mesic Hardwood Forest	1,700
Dry and Xeric Oak Forest, Woodland, and Savannah	2,100

The alternatives discussed below were formulated to meet the goals and objectives and respond to the issues generated by the scoping process. The alternatives are described, compared, and assessed primarily in terms of how well they accomplish the purpose and need for the proposal and relate to the issues developed for the project.

## Proposed Action

The Apalachicola National Forest is proposing several actions in Compartment 113 of the Apalachicola National Forest, Apalachicola Ranger District in Liberty County, Florida. These actions are needed to restore and interpret the area to early 1900’s era conditions, to improve gopher tortoise habitat, maintain or improve forest health, and to implement the direction of the forest plan.

The proposed actions include timber harvest related to historical restoration by clearcutting 21 acres that were formerly wildlife openings, and planting these areas to native groundcover. Habitat improvement for the gopher tortoise (*Gopherus polyphemus*) and its commensals by: Row thinning approximately 108 acres of pine plantations, ecosystem restoration of 40 acres of “off-site” slash pine by clearcutting and re-planting to longleaf pine; Removal cut and biomass removal of 27 acres of loblolly, laurel oak, and sparkleberry and planting to longleaf, and thinning 111 acres of immature slash and loblolly pine stands. Actions connected to the proposed timber harvest include site preparation for tree planting using the herbicides triclopyr and or hexazinone, using and maintaining approximately 2.05 miles of forest roads, performing reconstruction work on approximately 2.94 miles of forest roads and 0.5 miles of temporary roads, and creating log landings. All of the proposed actions, if approved, would occur within the next 5 to 7 years.

## Decision Framework

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Given the purpose and need, the deciding official reviews the proposed action and the other alternatives in order to make the following decisions.

The responsible official will decide whether or not to restore and interpret the area to early 1900's era conditions, improve gopher tortoise habitat, improve forest health and sustainability and to implement the forest plan within the Bradwell Game Farm Analysis Area. If a decision is made to improve this habitat then additional decisions must be made on the methods that would be utilized to make these improvements and their connected actions, such as chemical site preparation verses mechanical site preparation, road reconstruction, or road closures.

## Public Involvement

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This proposal has been listed in the Schedule of Proposed Actions for the Apalachicola National Forest each quarter since April 01, 2009. Public notification on this proposal began when a legal notice was posted in the Tallahassee Democrat on notifying readers of our intent to conduct an analysis of resources in the project area. Scoping letters were mailed to interested and affected agencies, organizations, and individuals on June 11, 2009 informing them of the proposed action and requesting their input. Then the pre-decisional Environmental Assessment was posted on the National Forest In Florida web page for two weeks to allow the public to provide input on the project. Several people responded to our requests for comments. Using the comments from the public, other agencies, and federally recognized tribes the interdisciplinary team developed a list of issues to address. Appendix A includes public scoping announcements and dates, and a summary of public comments and how they were addressed in the analysis.

## Issues

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The Forest Service separated the issues into two groups: significant and non-significant issues. Significant issues were defined as those directly or indirectly caused by implementing the proposed action. Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..." A list of non-significant issues and reasons regarding their categorization as non-significant may be found in appendix A in this document.

As for significant issues, the Forest Service identified the following topics raised during scoping. Significant issues are defined through consideration of the extent of their geographic distribution, the duration of their effects, and the intensity of interest or resource conflict. After reviewing pertinent information an Interdisciplinary Team (IDT) determined the following to be significant issues concerning the Bradwell Game Farm Analysis Area:

1. What are the possible effects of proposed activities on Threatened and Endangered (T&E) plants and animals, and/or their habitat?

2. Are there opportunities to restore longleaf pine on sites where "off-site" slash pine or laurel oak is now growing?
3. This area of the forest has several high probability archeological areas, and many known areas. How can these be protected, restored and interpreted?
4. There are several pine plantations that have trees that are at high risk for southern pine beetle infestations, and have had outbreaks in the past.
5. What are the opportunities to improve habitat for gopher tortoise (*Gopherus polyphemus*) and eventually indigo snakes?
6. Is there an opportunity to put in a boat ramp sufficient for motorized boats with a parking area?

## Comparison of Alternatives, including the Proposed Action

This chapter describes and compares the alternatives considered for the Bradwell Game Farm Analysis Area project. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker. Some of the information used to compare the alternatives is based upon the design of the alternative (i.e., herbicide versus mechanical site preparation) and some of the information is based upon the environmental, social and economic effects of implementing each alternative (i.e., the economic impacts of timber harvest versus no action).

## Alternatives

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### *Alternative A*

#### *The Proposed Action*

The purpose of the proposed actions is to restore and interpret the area to early 1900's era conditions, improve gopher tortoise habitat, and improve forest health and sustainability. The proposed actions are needed to move toward the desired future conditions set forth in the National Forests in Florida Revised Land and Resource Management (Forest) Plan 1999.

The proposed action includes:

- 1) Interpretation: Using primarily existing travelways, establish a mixed use trail to access the various historical sites. Two existing parking areas would be improved as shown Figure 3. Kiosks will be built at the various sites for education and interpretation.
- 2) Recreation: A primitive canoe launch on the Ochlocknee River will be constructed at the south end of FR194, with improvements to the existing parking area.
- 3) Clearcutting 21 acres in Stands 8, 11 and 12 to restore historic wildlife openings. These will be revegetated with native groundcover by either seeding or planting plugs.
- 4) Row thinning approximately 108 acres of pine plantations to 50 Basal area (Stands 6, 7, and 10).
- 5) Restoring approximately 40 acres of longleaf pine by clearcutting "off-site" slash pine in stand 5 and in removing scattered clumps of loblolly pine and biomassing and firewood removal on hardwoods on 27 acres in stand 31. Following timber removal, restoration would involve preparing the site for tree planting using herbicides (Triclopyr or Hexazinone), planting or seeding native groundcover, and hand planting to longleaf pine. Herbicide release may be used if needed.
- 6) Thinning 41 acres of immature loblolly pine stands from below (Stands 13, 15, 16, 18, and 20).

- 7) Thinning 70 acres of loblolly with scattered bottomland hardwood to 50 Basal Area. Any desirable hardwood would be favored to be left over the pine. This is to move Stand 19 to a mixed loblolly pine - bottomland hardwood stand. Scattered openings may be seeded or planted with hardwood seedlings if needed after harvest. Herbicide (triclopyr) would be used to treat undesirable hardwoods and understory shrubs.
- 8) Hardwood control on 15 acres in stands 14 and 15 by herbicide (triclopyr or hexazinone).

Actions connected to the proposed timber harvest include:

- 1) Use and maintain approximately 2.05 miles of forest roads and 0.5 miles are temporary non-system roads.
- 2) Perform reconstruction work on approximately 2.94 miles of these forest roads. (FR 194, FR 194 B, FR 194 D, and FR 194E)
- 3) Creating log landings to facilitate the logging operations.

All of the above actions, if approved, would occur within the next 5 to 7 years.

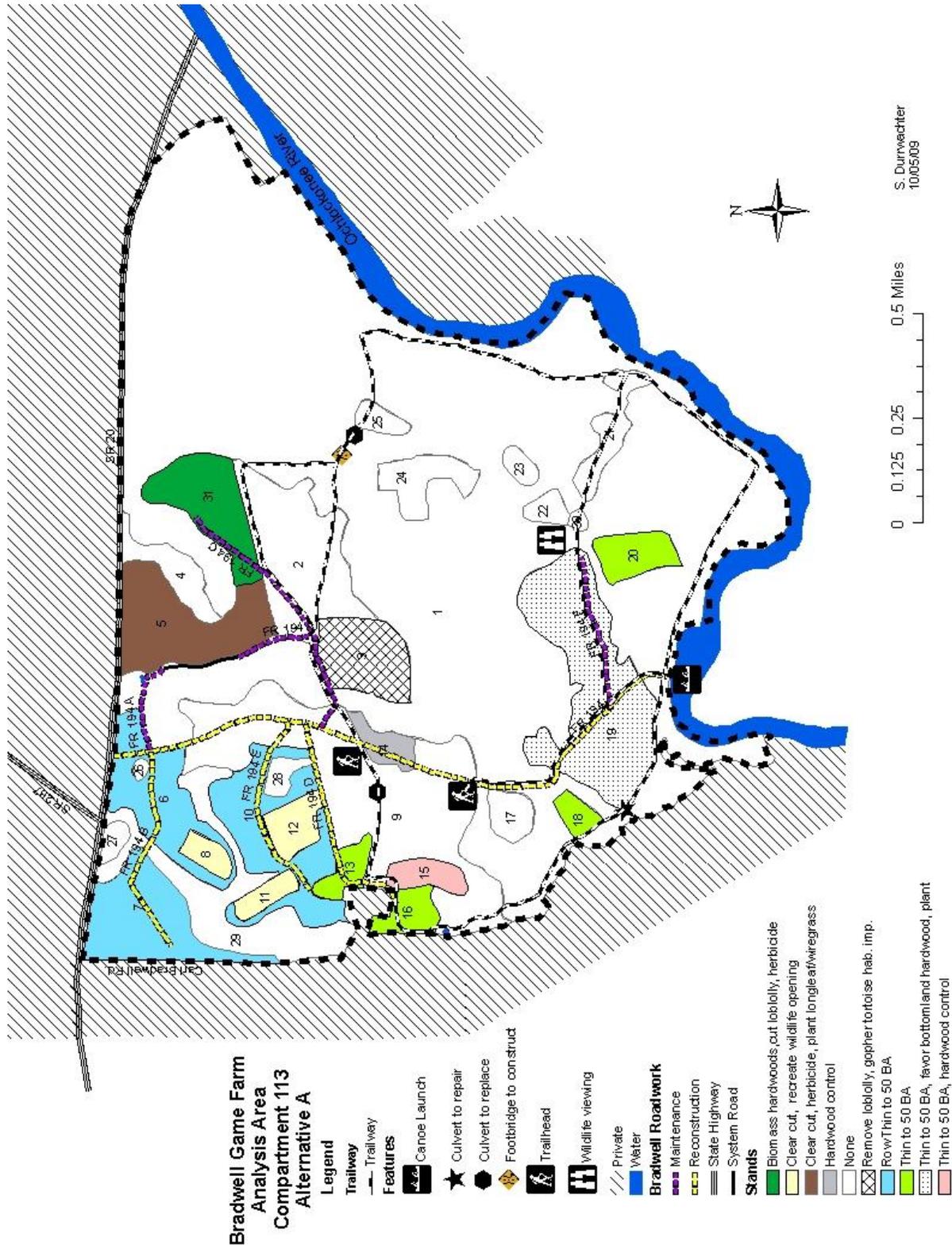
**Table 1. Stands with Commercial Timber Removal Alternative A**

Compartment	Stand	Acres	Type of Cut	Volume (ccf)
113	3	5	Removal Cut	15
113	5	40	Clearcut	534
113	6	32	Row Thin	281
113	7	37	Row Thin	268
113	8	5	Clearcut for wildlife opening	121
113	10	39	Row Thin	481
113	11	6	Clearcut for wildlife opening	157
113	12	10	Clearcut for wildlife opening	165
113	13	7	Thin from Below	65
113	15	8	Thin From Below	45
113	16	9	Thin From Below	167
113	18	5	Thin from Below	94
113	19	70	Thin from Below, Favor Hardwoods	460
113	20	12	Thin from Below	49
113	31	27	Removal Cut	13
Total		312		2914

Table 2. Cultural Treatments for Alternative A

Compartment	Stand	Acres	Cultural Treatment
113	3	5	Herbicide (Triclopyr or Hexazinone) treatment of residual hardwood, plant or seed native groundcover if needed
113	5	40	Herbicide (Triclopyr or Hexazinone), burn, plant longleaf, plant or seed native groundcover, herbicide release
113	6	32	Biomass removal, burn
113	7	37	Biomass removal, burn
113	8	5	Burn, Plant or seed native groundcover
113	10	39	Biomass removal, burn
113	11	6	Burn, Plant or seed native groundcover
113	12	10	Burn, Plant or seed native groundcover
113	13	7	Biomass removal, burn
113	14	4	Herbicide hardwoods (Triclopyr or Hexazinone), burn
113	15	8	Biomass removal, burn
113	16	9	Biomass removal, burn
113	18	5	Biomass removal, burn
113	19	70	Biomass removal, Herbicide (Triclopyr) undesirable hardwoods, plant or seed openings with hard mast species, release with herbicide (Triclopyr)
113	20	12	Biomass removal, burn
113	31	27	Biomass and firewood removal, herbicide (Triclopyr or Hexazinone), burn, plant longleaf, plant or seed native groundcover, herbicide release
Total		316	

Figure 2. Alternative A



### *Alternative B- Handtools*

The Forest Service is proposing to restore and interpret the area to early 1900's era conditions, improve gopher tortoise habitat, and improve forest health and sustainability. The proposed actions are needed to move toward the desired future conditions set forth in the National Forests in Florida Revised Land and Resource Management (Forest) Plan 1999.

This alternative is the same as Alternative A, without the use of herbicides.

The hand tool alternative includes:

- 1) Interpretation: Using primarily existing travelways establish a mixed use trail to access the various historical sites. Two existing parking areas would be improved as shown Figure 3. Kiosks will be built at the various sites for education and interpretation.
- 2) Recreation: A primitive canoe launch on the Ochlocknee River will be constructed at the south end of FR194, with improvements to the existing parking area.
- 3) Clearcutting 21 acres in Stands 8, 11 and 12 to restore historic wildlife openings. These will be revegetated with native groundcover by either seeding or planting plugs. Stand 3 is an existing wildlife opening, and a removal cut will take out loblolly pine that has seeded in on the edges of the stand.
- 4) Row thinning approximately 108 acres of pine plantations to 50 basal area (Stands 6, 7, and 10).
- 5) Restoring approximately 40 acres of longleaf pine by clearcutting "off-site" slash pine in stand 5 and in removing scattered clumps of loblolly pine and biomassing and firewood removal of hardwoods on 27 acres in stand 31. Following timber removal, restoration would involve preparing the site for tree planting using hand tools, planting or seeding native groundcover, and hand planting to longleaf pine. Hand tool release may be used if needed.
- 6) Thinning 41 acres of immature loblolly pine stands from below (Stands 13, 15, 16, 18, and 20).
- 7) Thinning 70 acres of loblolly with scattered bottomland hardwood to 50 Basal Area. Any desirable hardwood would be favored to be left over the pine. This is to move Stand 19 to a mixed loblolly pine - bottomland hardwood stand. Scattered openings may be seeded or planted with hardwood seedlings if needed after harvest. Hand tools would be used to treat undesirable hardwoods and understory shrubs.
- 8) Hardwood control on 15 acres in stands 14 and 15 by hand tools.

Actions connected to the proposed timber harvest include:

- 1) Use and maintain approximately 2.05 miles of forest roads and 0.5 miles are temporary non-system roads.
- 2) Perform reconstruction work on approximately 2.94 miles of these forest roads. (FR 194, FR 194 D, FR 194 B, and FR 194E)
- 3) Creating log landings to facilitate the logging operations.

All of the above actions, if approved, would occur within the next 5 to 7 years.

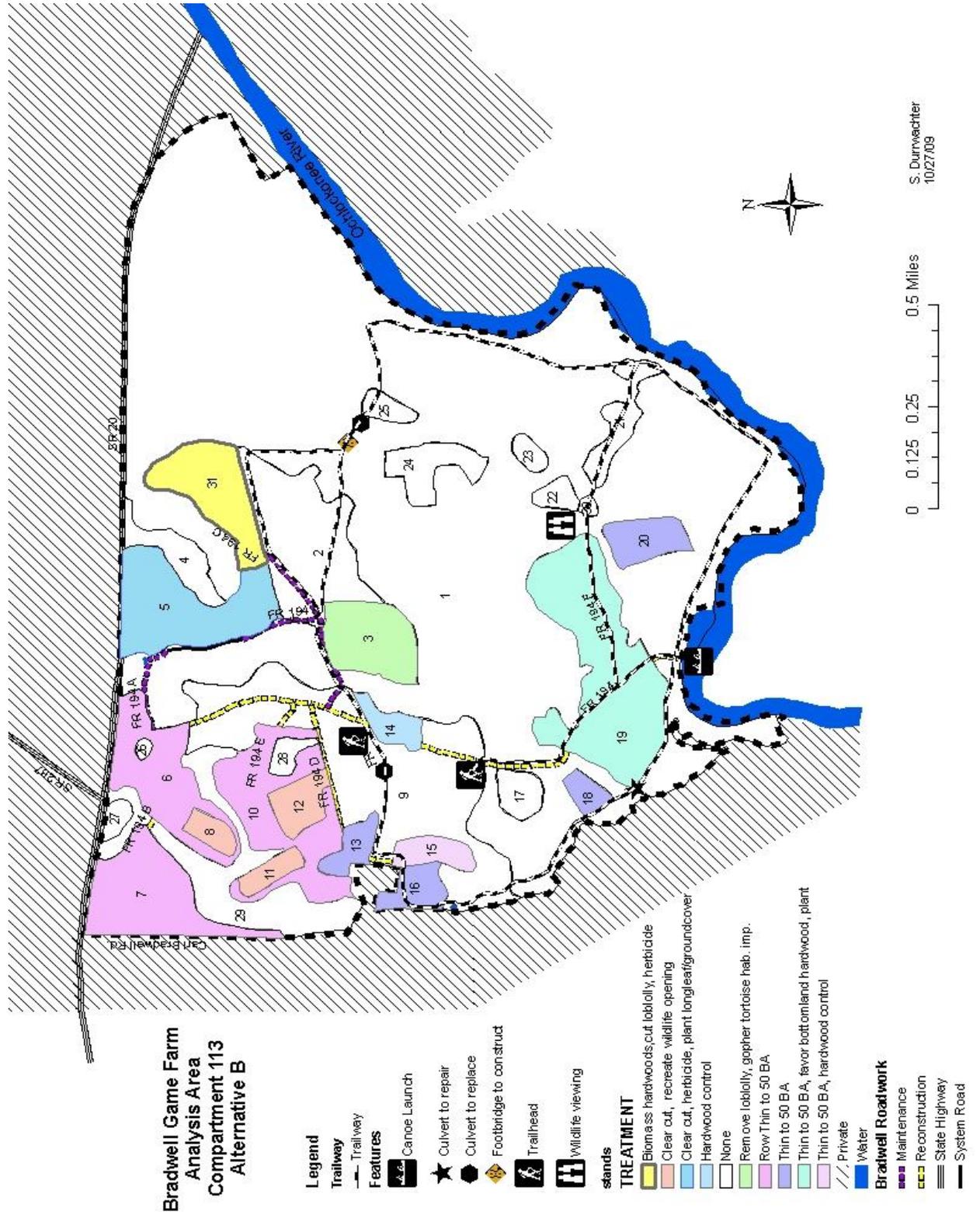
**Table 3. Stands with Commercial Timber Removal Alternative B**

Compartment	Stand	Acres	Type of Cut	Volume (ccf)
113	3	5	Removal Cut	15
113	5	40	Clearcut	534
113	6	32	Row Thin	281
113	7	37	Row Thin	268
113	8	5	Clearcut for wildlife opening	121
113	10	39	Row Thin	481
113	11	6	Clearcut for wildlife opening	157
113	12	10	Clearcut for wildlife opening	165
113	13	7	Thin from Below	65
113	15	8	Thin From Below	45
113	16	9	Thin From Below	167
113	18	5	Thin from Below	94
113	19	70	Thin from Below, Favor Hardwoods	460
113	20	12	Thin from Below	49
113	31	27	Removal Cut	13
Total		312		2914

**Table 4. Cultural Treatments for Alternative B**

Compartment	Stand	Acres	Cultural Treatment
113	3	5	Hand tool treatment of residual hardwood, plant or seed native groundcover
113	5	40	Hand tool treatment of residual hardwood, plant longleaf, native groundcover restoration, hand tool release
113	6	32	Biomass removal, burn
113	7	37	Biomass removal, burn
113	8	5	Burn, Plant or seed native groundcover
113	10	39	Biomass removal, burn
113	11	6	Burn, Plant or seed native groundcover
113	12	10	Burn, Plant or seed native groundcover
113	13	7	Biomass removal, burn
113	14	4	Hand tool treatment of residual hardwood
113	15	8	Biomass removal, burn
113	16	9	Biomass removal, burn
113	18	5	Biomass removal, burn
113	19	70	Biomass removal, Hand tool treatment of residual hardwood, plant or seed openings with hard mast species, release with hand tools
113	20	12	Biomass removal, burn
113	31	27	Biomass and firewood removal, hand tool treatment of residual hardwood, plant longleaf, seed or plant native groundcover , hand tool release
Total		316	

Figure 3. Alternative B



## Alternative C No Action

Under this alternative, only normal operations would be continued such as prescribed burning for fuel reduction, road maintenance on roads that are currently graded, and landline maintenance. No commercial harvesting of timber or road reconstruction would occur as a result of this analysis.

## Alternatives considered but not documented in detail

The public suggested an alternative that would that a concrete boat ramp be constructed instead of a primitive canoe launch. It was determined by the I. D. team that this was not an appropriate location for this type of structure, because of the steep nature of the river bank and because it may cause unfair competition with the private boat ramps adjacent to the project area. Also, the Florida Division of Forestry is pursuing the possibility north of Highway 20 on the Ochlocknee River.

## Coordination Measures Common to All Alternatives

Coordination measures were developed to ease some of the potential impacts the various alternatives may cause. The following coordination measures may be applied to any of the action alternatives.

- *If modifications are made in the project, or if additional information regarding the effects of the project on listed species becomes available, the U.S. Fish and Wildlife Service (USFWS) would be notified and consultation would be reinitiated if the FWS or the Forest Service determines it is needed.*
- *To enhance wildlife habitat, retain throughout the forest all relict and flattop longleaf and slash pines and some that are misshapen, poorly formed, or suppressed (Forestwide standard, VG-12).*
- *If gopher tortoises are found clearly mark a 15-foot buffer around the entrance to every gopher tortoise burrow. Keep heavy equipment out of this buffer zone during both harvesting and regeneration. Forestwide standard WL-11.*
- *Timber contractors would be instructed about the possible presence of eastern indigo snakes and would be instructed that if a snake is observed during the course of harvesting timber, the animal should not be harmed, but permitted to leave the area.*
- *Known cultural resource sites would be designated on the Sale Area Map and painted out on the ground. These areas would be avoided during ground-disturbing activities. There are historic fences in most of the treatment stands that will be protected during all operations.*
- *Road segments designated by the Forest Archeologist would not be graded, ditched, or otherwise disturbed. Fill material may be placed on these sections.*
- *If any new cultural resources sites were discovered, work would stop until the site is surveyed and mitigated by the Forest Archeologist.*
- *An Emergency Spill Plan would be developed to minimize hazards to people and natural resources in the event of an accident (located in appendix C.)*
- *The guidelines for planning and applying herbicides contained in the Vegetation Management Environmental Impact Statement would be followed (Veg. Mgmt. FEIS 1989)*
- *Establish slash treatment zones when harvest areas are adjacent State Highway 20.*
- *Utilize biomass removal of sub-merchantable material in all treatment stands if a market develops.*

- Restore native groundcover in any treatment stand if needed following timber harvest.
- Biomass removal would be limited to the amount not needed to maintain adequate nutrient cycling.

## Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

**Table 5. Comparison of Alternatives**

Proposed Actions	Units	Alternatives		
		A	B	C
Restore and Interpret early 1900's conditions				
Establish mixed use trail with kiosks	each	1	1	0
<b>Gopher Tortoise Habitat Improvement By:</b>				
Reducing Basal Area and Increasing Average Tree Diameter:				
Thin young pine plantations from below	Acres	108	108	0
Thin older slash and loblolly stands from below	Acres	111	111	0
Recreating historic wildlife openings	Acres	21	21	0
Longleaf pine restoration:				
Remove off-site slash, plant or seed native ground cover, hand plant longleaf pine.	Acres	40	40	0
Remove scattered loblolly, biomass and firewood removal of hardwoods, plant or seed native groundcover, hand plant longleaf pine, release.	Acres	27	27	0
Herbicide Triclopyr or Hexazinone	Acres	146	0	0
Hardwood control by Hand tools		0	146	
<b>Improving Forest Health by:</b>				
Remove trees susceptible to southern pine beetle:				
Target diseased trees during thinning operations	Acres	219	219	0
<b>Implement the forest plan by:</b>				
Identify the access for analysis area:				
Miles of road to close	Miles	00	0	0
Move area toward future desired condition:				
Special Interest Area 3.1	Yes/No	Yes	No	No
<b>Connected Actions to Proposed Actions:</b>				
Road maintenance for timber sale	Miles	2.05	2.05	0
Road reconstruction to haul timber removed	Miles	2.94	2.94	0
Temporary Roads	Miles	0.5	0.5	0
<b>Forest products produced:</b>				
Sawtimber	CCF	767	767	0
Pulpwood	CCF	2147	2147	0
Product Value	Dollars	126,209	126,209	0
Net Present Worth	Dollars	26,727	27,727	0

The following table summarizes the environmental consequences by alternative.

**Table 6. Comparison of Environmental Consequences by alternative**

Affected Environment	Alternative A	Alternative B	Alternative C
Air Quality	Temporary decrease during harvesting operations	Temporary decrease during harvesting operations	No Effect
Soils	Some nutrient loss from tree harvesting and introduction of Hexazinone into the environment.  Some nutrient loss from the removal of biomass.	Some nutrient loss from tree harvesting.  Some nutrient loss from the removal of biomass.	No Effect
Water	Temporary increase in turbidity during construction of rock crossings.	Temporary increase in turbidity during construction of rock crossings.	No Effect
Vegetation	Some vegetation would be removed through timber cutting and other vegetation will be top killed through the use of herbicides	A small portion of the vegetation would be top killed during hand tool operations, but would rapidly re-sprout	No Effect
PETS Plant Species	No Effect	No Effect	No Effect
MIS Plant Species	No Effect	No Effect	No Effect
MIS Animal species	Beneficial effect by improving gopher tortoise habitat.	Beneficial effect by improving gopher tortoise habitat.	May Effect the gopher tortoise by not maintaining habitat conditions
Visual Quality	Short-term decrease with and eventual long-term gain in visual quality	Short-term decrease with and eventual long-term gain in visual quality	Long-term reduction in visual quality as none of the existing environmental conditions would be improved
Recreation	Temporary reduction in opportunities due to timber harvesting and herbicide application,  Long term improvement with trails, interpretation and canoe launch.	Temporary reduction in opportunities due to hand tool site preparation.  Long term improvement with trails, interpretation and canoe launch.	No immediate effect, long-term reduction in wildlife viewing
Cultural Resources	No Effect	No Effect	No Effect
Economics	Beneficial effect by offering timber products on the market and producing jobs	Beneficial effect by offering timber products on the market and producing jobs	No Effect
Transportation system	Improvement by reconstructing 2.94 miles of roads.	Improvement by reconstructing 2.94 miles of roads.	No Effect
Environmental Justice	No Effect	No Effect	No Effect

## **ENVIRONMENTAL CONSEQUENCES**

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for the comparison of alternatives presented in the chart above.

The Bradwell Game Farm Analysis Area is located in the north section of the Apalachicola Ranger District of the Apalachicola National Forest, in Liberty County, Florida. This analysis area consists of approximately 1422 acres. The analysis area is unclassified in the Revised Land and Resource Management Plan for the National Forests' in Florida. This analysis area can be classified into two land type associations 1) the Apalachicola Depressions and Uplands, and 2) the Apalachicola Bays and Flatwoods These Land Type Associations are described on page B-7 of the Final Environmental Impact Statement for the Revised Land and Resource Management Plan for National Forests in Florida.

### **Physical Environment Effects**

#### **Soils:**

**Existing Condition:** Bradwell Game Farm Analysis Area is underlain by 14 different soil associations as described by the Soil Survey of Liberty County, Florida, NRCS, 2006.

The Alpin series is excessively well drained on hillslopes, with a seasonal high water table at a depth of greater than 72 inches. The surface layer down to 10 inches is brown sand, 10 to 25 inches is brownish yellow sand, and 25 to 45 inches is yellow sand. Subsoil is light gray sand that has strong brown loamy sand layers about 5 millimeters thick.

The Bibb series is dominantly nearly level, very poorly drained and poorly drained soils, that have a sandy or mucky sand surface layer and a sandy or loamy subsoil; on flood plains.

The Blanton series are on the slightly convex ridges and they are somewhat poorly drained. The surface layer is dark grayish brown sand overlaying brown sandy subsoil. Runoff is slow and internal drainage is rapid. Organic matter is low, reaction is strongly acid and fertility is low.

The Chipley series consists of somewhat poorly drained soils formed in sandy marine sediments. The water table is within a depth of 20 to 40 inches for two to four months during most years. Shipley soils have a very dark gray sand surface layer about six inches thick over a brownish yellow to gray sandy subsoil. They occur on moderately low uplands.

The Foxworth series consists of moderately well drained sandy soils of marine or Aeolian origin. A water table is between depths of 40 to 72 inches for one to three months of most years. Foxworth soils have a gray sandy surface about four inches thick and a pale brown to white subsoil. Foxworth soils occur on nearly level to gently sloping uplands and sloping side slopes leading to drainageways.

The Garcon, Ochlocknee and Ousley association is somewhat poorly drained, and is found in stream terraces and flood plains. The dominant soil is Garcon series, which at 0 to 8 inches, very dark grayish brown fine sand, and at 8 to 22 inches brown fine sand that has yellowish brown mottles. The subsoil at 22 to 31 inches is yellowish brown fine sand and yellowish red mottles, and at 44 to 80 inches is light gray fine sand that has yellowish brown mottles.

The Hosford mucky sand is found on lower hill slopes, and is very poorly drained. From 0 to 4 inches is black mucky coarse sand, 4 to 66 inches is very dark grayish brown mucky coarse sand and the subsoil is very dark grayish brown sand. The wet season high water table is at the surface to 6 inches in depth.

The Hurricane series is found on knolls and rises, is somewhat poorly drained, with a seasonal high water table of 18 to 42 inches. The dominant soil is Hurricane, which from 0 to 8 inches is dark grayish brown sand, 8 to 24 inches is light yellowish brown sand, and 24 to 27 inches is light gray sand with reddish yellow mottles. From 37 to 54 inches is light gray sand that has reddish yellow mottles, 54 to 64 inches is pinkish gray sand that has yellowish red mottles, and the subsoil at 64 to 80 inches is dark reddish brown sand that has black nodules.

The Osier series is a poorly drained soil found in flats. The seasonal high water table is at the surface to 6 inches in the wet season. From 0 to 7 inches is dark gray sand, 7 to 36 inches is gray fine sand, 36 to 80 inches also has brown and yellow mottles.

The Plummer soil series consists of poorly drained sandy soils formed in marine or fluvial sediments. The water table is at the surface or within the depth of 15 inches for three to six months of most years. Depressional areas are ponded for six months or more. Plummer soils have a very dark gray sandy surface layer about five inches thick over a gray to light gray sandy subsoil. Plummer soils occur on level to depressional landscapes and along poorly defined drains.

The Pottsberg series is dominantly nearly level, poorly drained soils that have a sandy surface layer, a sandy subsoil, and a spodic layer (hardpan); in areas of flatwoods and flats. The seasonal high water table is 6 to 18 inches in the wet season.

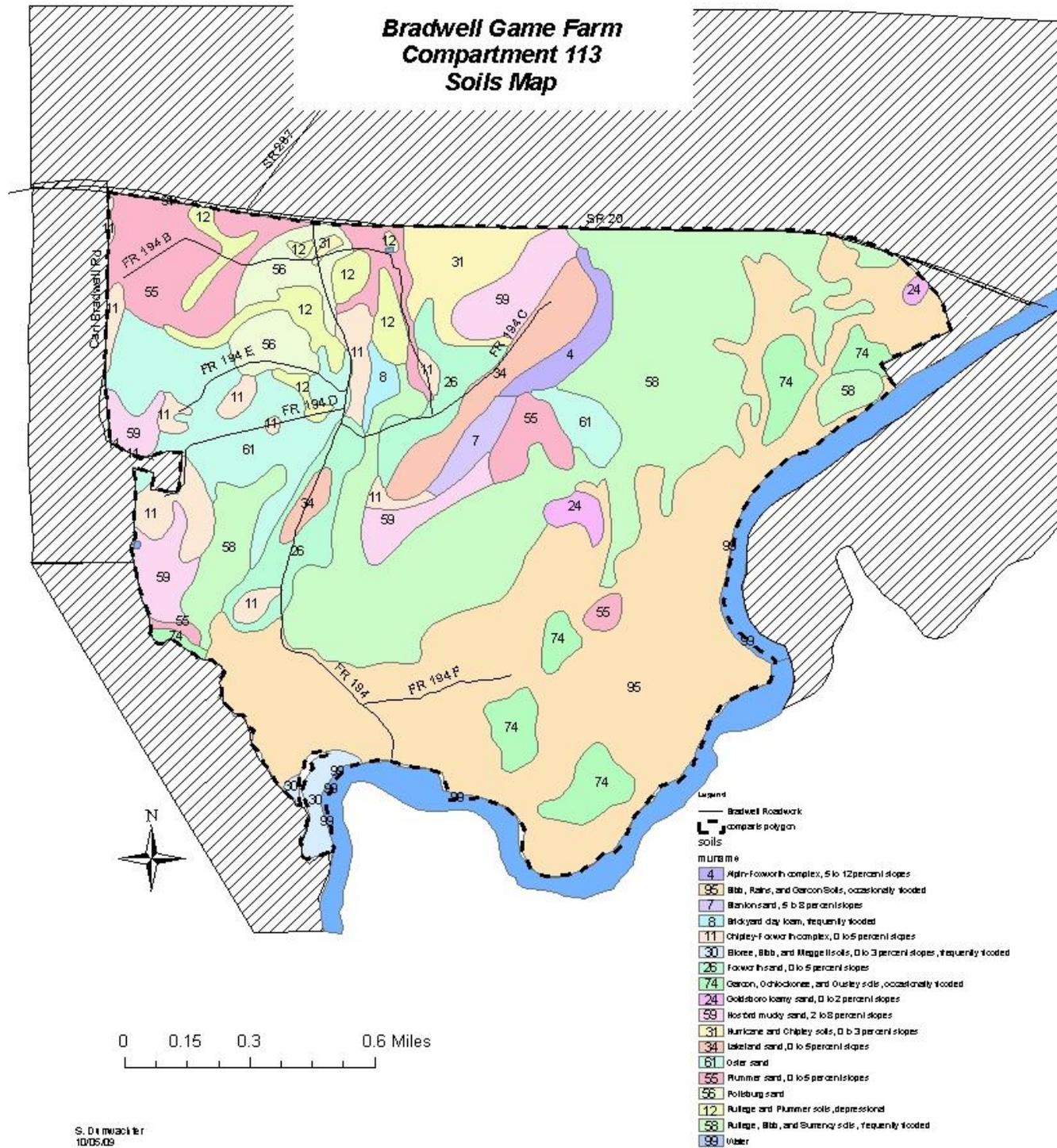
The Rutledge series is dominantly nearly level, very poorly drained soils that have a black fine sand 0 to 12 inches, dark gray fine sand 12 to 30 inches, gray fine sand 30 to 60 inches, and light gray fine sand 60 to 80 inches; on flood plains and in depressions.

The Surrency soil series consists of very poorly drained sandy and loamy soils of marine or fluvial origin. The water table is at or near the surface of the soil for most of the year, and ponding is common. Surrency soils have a black or very dark gray surface horizon, 20 to 40 inches thick over a gray sandy clay loam with red and yellowish brown mottles.

Table 7. Analysis Area Soils

Soil Symbol	Soil series	Acres in Treatment	Drainage Class
4	Alpin-Foxworth complex, 5 to 12 percent slopes	7	Moderately to excessively well drained
95	Bibb, Rains, and Garcon Soils, occasionally flooded	72	Poorly drained to somewhat poorly drained
7	Blanton sand, 5 to 8 percent slopes	1	Moderately well drained
11	Chipley-Foxworth complex, 0 to 5 percent slopes	30	Somewhat poorly drained to moderately well drained
26	Foxworth sand, 0 to 5 percent slopes	21	Moderately well drained
74	Garcon, Ochlockonee, and Ousley soils, occasionally flooded	11	Somewhat poorly drained to well drained
59	Hosford mucky sand, 2 to 8 percent slopes	6	Very poorly drained
31	Hurricane and Chipley soils, 0 to 3 percent slopes	30	Somewhat poorly drained
34	Lakeland sand, 0 to 5 percent slopes	31	Excessively drained
61	Osier sand	39	Poorly drained
55	Plummer sand, 0 to 5 percent slopes	49	Poorly drained
56	Pottsburg sand	31	Poorly drained
12	Rutlege and Plummer soils, depressional	4	Very poorly drained
58	Rutlege, Bibb, and Surrency soils, frequently flooded	5	Poorly to very poorly drained

Figure 4. Soils Map



**Environmental Effects:**

Some soil movement may occur during silvicultural operations. Some soil may stick to vehicle tires and trees being removed, which may cause an insignificant amount of soil to be removed from the site.

Soil movement may also occur during road reconstruction and improvement work. The amount of soil movement is not expected to be significant and would be mitigated by following the standards and guidelines established in the Forest Plan and the "Silvicultural Best Management Practices Manual".

**Alternative A** – This alternative would harvest trees on approximately 312 acres, reconstruct 2.94 miles of roads and maintain 2.05 miles of road. Road reconstruction and maintenance have the highest potential for soil movement out of all the actions in this alternative.

Some soil may be displaced during the logging operations when skidders and other heavy equipment traverse across the land especially when dragging trees or yielding a blade. The amount of impact to the soil resources is not expected to be significant when "Best Management Practices" and mitigation measures are applied.

No soil movement would occur due to site preparation, which would be done using approved herbicides. However the use of herbicides may have an affect on soils.

The herbicide hexazinone would be applied on a six-foot by six-foot grid pattern over the longleaf restoration areas. The application rate would be 5 ml of 50% diluted herbicide with water per spot. This equals approximately 3 quarts of hexazinone per acre applied to 60 acres. Hexazinone is a Photosynthetic inhibitor. It is readily absorbed through the roots and, to a lesser degree, through plant foliage. Hexazinone has a moderate half-life of 1-6 months with the typical being approximately 90 days. It is a biodegradable herbicide with its primary breakdown by soil microbes.

The herbicide Triclopyr would be applied by a combination of hack and squirt and cut stump. The hardwood would be hacked through the cambium, encircling the stem completely. The cuts would treated with a 30% solution of Garlon 4 and oil. Hardwoods that are completely severed, the stump will be treated with the same solution, covering the cut face of the stump. In the soil, Triclopyr is not highly mobile. It is rapidly broken down by soil microbes and ultra-violet light, persisting on average of 30-56 days depending on soils and weather. Its half life in water is about 10 hours at 72°F.

The environmental consequences of this herbicide are also discussed in Chapter IV of the Final Environmental Impact Statement for Vegetation Management in the Costal/Piedmont, Volume I.

**Alternative B** – The commercial timber sale portion of this alternative including the road reconstruction and maintenance would affect soils in the same manner as alternative A.

It is anticipated that some people would say the restoration practices would not meet the requirements of forest plan standard and guideline VG-18. This standard and guideline is interpreted to apply only to locations that include intact ground cover and does not apply to site preparation or restoration activities where the ground cover is in poor condition.

Some soil movement may occur during mechanical site preparation for tree planting but would be localized. Some soil may be moved off site through water runoff. The environmental consequences of mechanical site

preparation are discussed at length in Chapter IV of the Final Environmental Impact Statement for Vegetation Management in the Coastal/Piedmont, Volume I.

**Alternative C** – Some soil movement would also occur under this alternative. The affect of prescribed burning on soils would be the same as alternatives A and B, because it is not anticipated that a change in the season of burning would affect the soils of the analysis area. The same firelines would be needed regardless of season of burn. The affect of road maintenance would also be similar to alternatives A and B but to a lesser degree. Heavy equipment would only operate where maintenance is needed and no activities are proposed that would require road reconstruction. Alternative C would have the least direct affect on soils.

## Water:

**Existing Condition:** Bradwell Game Farm Analysis Area falls within the boundaries the Ochlocknee River (HCU# 0312000310A) watershed. The Ochlocknee watershed is approximately 149,689 acres within the boundary of the forest. The In Florida, there is not a sharp or distinct difference between watershed boundaries. The land is mostly flat to gently rolling and watersheds are generally broad and meandering.

This watershed is drained by a series of ephemeral, intermittent, and perennial streams. There are also small ponds and swamps (wetlands) in this region that do not drain into these streams. Lake Talquin is the closest large body of water to the analysis area. The Lake Talquin State Forest and private land lie between the National Forest and the lake.

None of the alternatives considered would destroy wetlands. Of the 15 stands considered for harvest and/or thinning only stands 19 and 20 are adjacent to perennial streams. All of these stands are separated from the stream by hardwoods or vegetative stringers at least 35 feet wide. If any intermittent streams were located during sale layout, a 35-foot streamside management zone (SMZ) would be designated on either side of the stream, to protect poorly drained soils from rutting or compaction and to reduce the sediment load to the creeks and wetlands from harvest activities. The 35-foot buffer acts as a filter to soil movement.

There are no known background water quality tests that have been completed within this area.

**Environmental Effects:** Water quality would not be significantly affected by the proposed action. Establishing Streamside Management Zones as directed in the Silvicultural Best Management Practices Manual and the Forest Plan standard and guidelines should mitigate the potential impact of siltation from prescribed burning, road construction, road maintenance, and silvicultural treatments.

The water table may rise temporarily after harvesting trees in alternatives A and B. This increase would be due to vegetation removal, which contributes to water losses through interception and translocation. With less vegetation on the sites, more rain would runoff and possibly contribute to soil movement.

**Alternative A** - The herbicide Hexazinone is prescribed for site preparation. Hexazinone is water-based and soil active especially porous soils with percolating water. Hexazinone tends to be highly mobile in soil and should not be applied to open water or saturated or poorly drained soil. It is not anticipated that the use of hexazinone would not have a significant affect on water quality. *No herbicides would be applied within 100 feet of open water or streams.* The application rates that would be applied are well below what is allowed on the

product labels. The application rates are at or below the requirements of the vegetative management EIS. There are no streams, lakes or ponds within the stands to be treated.

The environmental consequences of this herbicide are discussed at length in Chapter IV of the Final Environmental Impact Statement for Vegetation Management in the Costal/Piedmont, Volume I.

**Alternative B** – Effects would be similar to alternative A, without the possible effects of herbicides. Revegetation of the treatment sites would be more rapid, due to re-sprouting of the cut material. The environmental consequences of hand tool site preparation are also discussed in Chapter IV of the Final Environmental Impact Statement for Vegetation Management in the Costal/Piedmont, Volume I.

**Alternative C** - It is not anticipated that prescribed burning would have a significant affect on water quality of this analysis area. The effects of prescribed fire on soil, water, and air quality are also described in the Final Environmental Impact Statement prepared for Vegetation Management in the Coastal Plain\Piedmont Volume 1, pages IV-80 thru 113.

## Air Quality:

**Existing Condition:** The ambient air quality for the Bradwell Game Farm Analysis Area is good. It is a Class 2 area as described in the amended Clean Air Act. (See the FY 2002 Monitoring and Evaluation report of the National Forests in Florida) There is one major wood processing plant eight miles north of the analysis area in Lowry, Florida. Prescribed fire is a fairly recent addition to the management of this analysis area. This compartment has been prescribed burned two times. The historical richness of the area vastly complicates the burns, due to the many fences and structures to protect. It also has a large amount of laurel oak and sparkleberry, which do not burn well. Table 5 shows the history of prescribed burning in these compartments since 1993.

**Table 8. Prescribed Burn History**

Compartment	Prescribed Fire History Since 1993
113	186 acres on 03/16/1999
113	578 acres on 02/20/2009

### Environmental Effects:

In alternative A, the use of herbicides would not cause a reduction in air quality, because no herbicides would be applied with foliar spray.

For alternatives A or B air quality would be temporarily reduced in the immediate vicinity where heavy equipment is working. If weather conditions were dry, the movement of heavy equipment would cause dust to rise into the air reducing air quality.

Alternative C may affect the air quality of this analysis area through prescribed burning and road maintenance. The impacts are anticipated to be less than alternatives A or B because there is a lot less activity under this alternative.

## Cumulative Effects to Air, Soils, and Water

Some of the past, present, and future management activities on National Forest land in the analysis area, in combination with the proposed alternatives, would have cumulative effects on the air, soils, and water resources in the analysis area.

Past management activities including timber harvesting, site preparation prior to plantation establishment and road building may have caused wetland sedimentation, wetland loss, soil loss (erosion), soil nutrient loss, and soil compaction in the analysis area. For the most part these effects from past management activities are no longer occurring, although existing roads in the analysis area likely contribute a small level of sediment to wetlands today. Because the proposed alternatives would have very little impact to air quality, soils, and water resources in the analysis area, and those impacts would be short-term, the cumulative effects of the proposed alternatives in combination with past management activities would be minor.

One cumulative impact of all alternatives on air quality would be conducting prescribed burns simultaneous with nearby landowners such as the Florida Division of Forestry (DOF). This could add to the impact of smoke to an area. The DOF permit system evaluates this impact by considering area pollution load before issuing a burn permit. No other cumulative effects are anticipated on air quality.

The analysis area is scheduled for prescribed burning approximately once every three years. Prescribed burning plays an essential role in nutrient cycling by releasing unavailable nutrients stored in plants, litter and duff. Prescribed burning, in combination with the Proposed Action, would have a small cumulative effect on nutrient loss by volatilizing nutrients and increasing nutrient leaching. Consumption of vegetation by prescribed burns may also cause a small increase in precipitation runoff, but additional sedimentation is unlikely due to the flat topography. Prescribed burns produce smoke and gases, which temporarily reduce air quality. Conducting prescribed burns when atmospheric dispersion, wind speed and wind direction is favorable limits this impact. By contrast, wildfires often occur when conditions are unfavorable. Logging slash created by the Proposed Action would increase fuel loadings and increase the amount of smoke produced during burning. If biomass removal is utilized this will reduce this effect even more.

In addition to prescribed burning, future management activities in the analysis area may include timber harvesting. Future timber harvesting activities would have effects to soil, air and water resources similar to the effects of the timber harvesting proposed for this project, but the effects could be greater or lesser, depending on the type of harvesting. It is unlikely that timber harvesting would be proposed again in this analysis area for another ten years. No cumulative effects to air quality, soils or water would occur because the effects of the currently proposed activities would be minor and short-term.

In addition to the cumulative effects of past, present and future management activities, the analysis area could be affected by activities on adjacent lands. The analysis area is bordered by State Highway 20 on the north, and is directly adjacent to private land, as well as Lake Talquin State Forest. Emissions from vehicles on the Highway 20 and emissions from private land such as wood stoves or trash burning could have a cumulative effect on air quality in the analysis area.

Private land near the analysis area varies from developed to undeveloped. Some of the undeveloped land is currently for sale, and development is expected to increase in this area due to its proximity to the National Forest, Lake Talquin, and Tallahassee. As this area continues to develop vegetation would likely be removed,

and run-off and erosion may occur. Increased run-off and erosion on adjacent private land could have a cumulative effect by increasing sedimentation to the streams that flow to the Ochlocknee River.

## **Biological Resources Effects**

### **Management Indicator Species (MIS) Wildlife**

#### **Affected Environment**

The general wildlife community that occurs in the Bradwell Game Farm Analysis Area is typical of the southern Coastal Plain, although likely not numerous due to present habitat conditions. Because it would be infeasible to monitor the effects of management on all wildlife species, certain species were chosen to be “management indicators”. Management indicator species (MIS) are selected to monitor the effectiveness of the Forest Plan direction in meeting the desired habitat conditions and plant/animal outcomes. Population changes in these selected species are believed to indicate the effects of management. The MIS chosen for discussion with this project are the bobwhite quail and wild turkey. The Forest Plan identifies bobwhite quail as indicators for sandhill, scrubby flatwoods, mesic flatwoods, or wet flatwoods community types. The wild turkey is considered a generalist. The community types in this project are sandhill, mesic to wet pine flatwoods and floodplain.

#### **Northern Bobwhite (*Colinus virginianus*)**

The bobwhite quail is a popular game bird and serves as an indicator species for sandhill and flatwoods communities on the National Forests in Florida. There is a rangewide effort to improve habitat and increase numbers. Breeding Bird Survey (BBS) data indicate low densities statewide. BBS counts and R8 bird point data for the Forest show the northern bobwhite at low and variable densities and trends difficult to determine (2007 Annual Monitoring and Evaluation Report, National Forests in Florida). This type of monitoring is planned to continue.

#### **Alternative A - Proposed Action**

The action alternative would contribute to improving habitat for the bobwhite quail. The control of woody vegetation with herbicide and mechanical methods are common practices used in quail management and would also enable us to apply fire in the stands more effectively. Bobwhites prefer open, well-burned pine stands. It is unlikely a significant population difference would be realized due to this one project. The effects of this and other ongoing and future projects that restore the open pine system could influence quail numbers in a noticeable way but these would be long-term changes. We would expect to see an increase in quail as the desired future condition for this area and the entire Forest is attained.

#### **Alternative B – Hand Tools**

Hand tool release could also result in bobwhite quail habitat improvement by assisting with the release of the groundcover which would then allow us to apply fire to the stands more efficiently. Due to the hardwood sprouting that would occur, this method would be less effective and have shorter lived benefits for reducing woody cover and therefore may have less influence on eventually increasing available habitat for bobwhite in this area. This alternative would produce much less early successional habitat than Alternative A.

### **Alternative C - No Action**

Under the no action alternative, bobwhite quail trends in this area would be expected to show no change or a decline. The continuation of prescribed burning alone would likely not improve habitat enough in the project area. Although prescribed burning is a necessary component of quail management, with the existing state of the project stands, application of routine prescribed burning alone may not achieve the goals for this area.

### **Wild Turkey (*Meleagris gallopavo*)**

The wild turkey is a very popular game species and there is increasing interest in this state to manage for higher numbers and improved hunter success. This species can be found in a variety of habitats including bottomland, upland hardwoods, mixed forests, and pine forests. The BBS routes on the Apalachicola National Forest have never recorded significant numbers of turkeys. Turkeys are too wary of humans to be counted accurately using a point count method. Track count transects conducted in cooperation with the Florida Fish and Wildlife Commission (FWC) had in the past detected turkeys at very low densities. Approximately 200 miles of road transects had been surveyed annually from 1993 to 2004 for tracks on both ranger districts. FWC staff had developed track indices but counts were so low trends are obscure. The turkey population does appear to be fairly stable and shows signs of increasing if anecdotal sightings are considered. Due to the proximity to the floodplain, the Bradwell Game Farm could offer excellent turkey habitat once the uplands are restored.

### **Alternative A - Proposed Action**

This action alternative would contribute to improving habitat for the wild turkey. The reduction of woody species with herbicide and mechanical means are common practices used in game management. These treatments would allow us to apply fire more effectively to the stands. Turkeys need a component of early successional habitat to thrive especially the poults and the treatments would provide this habitat. It is unlikely a significant population difference would be achieved due to this one project. But when this project is added to other projects potentially going on in this area, an increase could be realized. So the effects of these and other ongoing and future projects that reduce restore the open pine system could influence turkey numbers in a noticeable way but these would be long-term changes. We would expect to see an increase in turkey as the desired future condition for this area and the entire Forest is attained.

### **Alternative B – Hand Tools**

Hand tool release could also result in wild turkey habitat improvement by assisting with the release the herbaceous groundcover which would then allow us to apply more fire efficiently to the stands. Due to the hardwood sprouting that would occur this method would be less effective and have shorter lived benefits, therefore may have less influence on eventually increasing available habitat for wild turkey in this area.

### **Alternative C - No Action**

Under the no action alternative, wild turkey trends in this immediate area would be expected to show no change or a decline. The continuation of prescribed burning alone would likely not improve habitat enough in the project stands. Although prescribed burning is a necessary component of turkey management on this Forest, with the existing state of the project area, application of prescribed fire alone may not achieve the goals of restoration and ground cover release.

**MIS not chosen for Bradwell Game Farm**

Bald eagle – indicator for bottomland forest, floodplain, swamp, hydric hammock, baygall, strand swamp, basin swamp, dome swamp, and aquatic. This project would not impact bald eagles in any measurable way.

Florida black bear – generalist, too many other factors can affect population trends, too widespread, although probably would benefit as thinning, reducing woody vegetation, and burning would increase the diversity of upland food plants and maintain a healthy system.

Large mouth bass – project is not in their habitat nor will it affect their habitat.

Pileated woodpecker – indicator for bottomland forest, floodplain, swamp, hydric hammock, baygall, strand swamp, basin swamp, dome swamp. This project would not have any significant impact on this woodpecker’s available habitat as only 70 acres would be thinned in the bottomlands.

Prothonotary warbler - indicator for bottomland forest, floodplain, swamp, hydric hammock, baygall, strand swamp, basin swamp, dome swamp. This project would occur in less than 70 acres of their habitat and would eventually improve it by removing pine, as they prefer deciduous floodplain.

White-tailed deer – generalist, too many other factors including hunting and use of different habitat types, but would benefit from increased diversity of food and overall health of system.

**Proposed, Endangered, Threatened and Sensitive Wildlife (PETS)**

A biological evaluation (BE) was prepared to determine the likely effects of the alternatives on PETS animals and/or their habitat. The table below summarizes the determination. See the Biological Evaluation in Appendix for more detail.

Table 9. Threatened, Endangered, and Sensitive Animal Effects Summary  
Bradwell Game Farm Analysis, October 2009.

SPECIES	ALT A	ALT A CUM	ALT B	ALT B CUM	ALT C	ALT C CUM
*Gray bat	No Effect					
*Wood stork	No Effect					
*RCW	No Effect					
*Indigo snake	No Effect					
*Flatwoods salamander	No Effect					
*Gulf sturgeon	No Effect					
*Mussels	No Effect					
Sensitive aquatic	No Impact					
Sensitive terrestrial	May Impact	Beneficial	May Impact	Beneficial	May Impact	Federal Listing

CUM = cumulative, over the long term

\* US Fish and Wildlife Service Endangered or Threatened

## Species Viability:

Species viability was addressed in the Forest Plan. The results of the Forest Plan viability analysis for species in the Bradwell Game Farm Analysis Area can be found in the FEIS Revised Land and Resource Management Plan for National Forests in Florida (Appendix E pg. E-9). This project is within the scope of the Forest Plan therefore, these viability analyses are considered valid.

## Management Indicator Species (MIS) Plants

### Affected Environment

The general plant community types identified in the Bradwell Game Farm analysis area are sandhills, mesic to wet pine flatwoods, and floodplains. MIS identified in the plan and present on the Apalachicola National Forest (ANF) are *Aristida beyrichiana*, *Ctenium aromaticum*, *Harperocallis flava*, *Macbridea alba*, *Pinguicula ionantha*, *Scutellaria floridana*, *Sporobolus curtissii*, *Sporobolus floridanus*, *Sporobolus junceus*, and *Xyris stricta*. The Forest Plan identifies these ten species as indicators for the following community types, four of which are represented to varying extents within the project area.

No locations of Fish and Wildlife Service (USFWS) listed threatened or endangered plant (T&E) species are known to occur which eliminates *Harperocallis flava* (E), *Macbridea alba* (T), *Pinguicula ionantha* (T), and *Scutellaria floridana* (T) from this analysis. Habitat does not exist in the project area for both *Xyris stricta* and *Sporobolus junceus*. Below is a summary of the species and the rationale for their selection as MIS species.

*Aristida beyrichiana*: Groundcover dominance indicates good ecological health of savannas, bogs, seepage slopes, depression marshes, sandhills, mesic flatwoods, and wet flatwoods. Dominance depends upon frequent fires and lack of mechanical disturbance.

*Ctenium aromaticum*: Co-dominance of this long-lived perennial bunch grass indicates good ecological health of mesic to poorly drained flatwoods, bogs, savannas, depression marshes, and the ecotones between pine flatwoods and wetlands. Population trends reflect fire frequency intervals and lack of mechanical disturbance.

*Harperocallis flava*: Presence indicates well-burned, ecologically healthy seepage slopes, bogs, and savannas.

*Macbridea alba*: Presence indicates good ecological health of mesic to poorly drained flatwoods. This plant is usually associated with the upper ecotones between the longleaf pine/wiregrass community and adjacent wetlands.

*Pinguicula ionantha*: Presence indicates good ecological health of strand swamps, dome swamps, and ecotones between these communities and adjacent wiregrass dominated savannas and flatwoods.

*Scutellaria floridana*: Presence indicates well-burned, ecologically healthy seepage slopes, bogs, savannas, and depression marshes.

*Sporobolus curtissii*: Presence of this long-lived perennial bunch grass indicates ecological health of mesic to poorly drained flatwoods. Population trends reflect fire frequency intervals and lack of mechanical disturbance.

*Sporobolus floridanus*: Presence of this long-lived perennial bunch grass indicates well-burned, ecologically healthy mesic to wet flatwoods, bogs, seepage slopes, savannas, and depression marshes that have not been mechanically disturbed.

*Sporobolus junceus*: Co-dominance of this long-lived perennial bunch grass (with *Aristida beyrichiana*) indicates ecological health of moderately to well-drained longleaf pine/wiregrass communities.

*Xyris stricta*: Presence/co-dominance indicates ecological health of cypress ponds and strands. Population trends reflect fire frequency intervals.

### **Trend Data**

In 1996, as part of an ecosystem Land Type Association (LTA) classification project, the National Forests in Florida began to establish permanent vegetation monitoring plots. By 1997, 101 LTA plots were established on the ANF, 50 on the Apalachicola Ranger District (ARD) and 51 on the Wakulla Ranger District (WRD).

In 2000, those plots with recorded occurrences of MIS plants were identified and the decision was made to use data obtained from these LTA plots to track MIS species trends. To date, five of the above listed MIS species have been documented on 43 of the 50 plots on the ARD (*Aristida beyrichiana*, *Ctenium aromaticum*, *Sporobolus floridanus*, *Sporobolus junceus*, and *Xyris stricta*). Four of the above listed MIS species have been documented on 30 of the 51 plots on the Wakulla District (*Aristida beyrichiana*, *Ctenium aromaticum*, *Sporobolus floridanus*, and *Sporobolus junceus*). Meaningful trend information is not available since these plots were sampled only once.

In addition to these LTA/MIS plots, twelve plots (three per species) were established for the federally listed T&E/MIS plants *Harperocallis flava*, *Macbridea alba*, *Pinguicula ionantha*, and *Scutellaria floridana*. Initial data has been collected from all of these plots and they have been revisited anywhere from 5-7 times each.

In 2007, the Forest Service, Florida Natural Areas Inventory (FNAI), and Dr. Doria Gordon of The Nature Conservancy jointly developed methods for monitoring the four federally threatened and endangered plants on the ANF. This monitoring methodology was designed to provide the Forest Service with an effective method of tracking their presence, status, and population trends. FNAI aided the Forest Service with monitoring and survey for new populations of these species in the spring/summer of 2007 and the ANF District Ecologist continued the monitoring in 2008. Data for all T&E/MIS species can be found in the *2008 Annual Monitoring and Evaluation Report for the National Forests in Florida*, which will be available online or at district offices by sometime mid 2009.

### **Alternative 1 – Proposed Action**

The action alternative would contribute to improving MIS plant habitat. Individual MIS plants may be crushed, broken, uprooted, buried or otherwise impacted during the proposed management actions (commercial timber harvest, longleaf pine planting, native groundcover planting and/or seeding, bottomland hardwood release and/or planting, herbicide and mowing). It is anticipated that herbicide application would improve MIS habitat conditions by reducing the hardwood midstory and, in concert with prescribed burning, result in an increase in the herbaceous component of the native groundcover.

We should expect to see small-scale positive impacts from implementation of this alternative. Each MIS evolved in the longleaf pine-wiregrass community and requires an open, fire-maintained habitat, with high light conditions and minimal competition. It is unlikely a measurable difference would be realized due to this one

project. The effects of this and other ongoing and future projects that restore the open pine system could influence MIS plants in a quantifiable way but these would be long-term changes.

### **Alternative 2 – Hand Tools**

This alternative is the same proposal as Alternative 1, except handtools would be used in place of herbicides for woody and herbeaceous plant management. Individual MIS plants may be crushed, broken, uprooted, buried, or otherwise impacted. Primary use of hand tools would not be as effective as herbicide for large-scale hardwood midstory removal and groundcover release. These treatments would address small-scale hardwood removal but would not be an effective means of halting competing vegetation stand-wide.

MIS individuals would gain much shorter-lived benefits from the improved sunlight and lack of competition. Once cut, the vegetation would rapidly re-sprout. A frequent prescribed burning regime could maintain these benefits if the herbeaceous vegetation recovers sufficiently to facilitate this, if not, woody vegetation would dominate again. All MIS under consideration require open habitat, with high light conditions and minimal competition. Long term, individuals will continue to be suppressed or otherwise impacted by the lack of sunlight with this alternative.

### **Alternative 3 – No Action**

The No-action Alternative would have a negative cumulative effect on MIS over time and result in a decreasing trend because affected species are light dependent. The primary risk factor repeatedly noted for many plants species is habitat conversion to plantations and subsequent shading/competition for resources. Individuals would likely continue to be suppressed or otherwise impacted by the lack of sunlight. Vegetative changes would be limited to those resulting from natural phenomena and prescribed burning and, with the existing state of the project stands, application of routine prescribed burning alone may not achieve the goals for this area. Native groundcover, including MIS, would continue to lose vigor.

## **Proposed, Endangered, Threatened and Sensitive (PETS) Plants**

### **Affected Environment:**

A Biological Evaluation (BE-Plants) was prepared to determine the effects of the alternatives on PETS plants and/or their habitat. The table below summarizes these determinations. See the BE in the Appendix for more detail.

Table 10. Threatened, Endangered and Sensitive Plant Effects Summary

SPECIES or ASSEMBLAGES	ALT A	ALT A CUM	ALT B	ALT B CUM	ALT C	ATL C CUM
Harperocallis flava *	No Effect					
Macbridea alba *	No Effect					
Scutellaria floridana*	No Effect					
Pinguicula ionantha*	No Effect					
Sandhills	May Impact	Beneficial	May Impact	Beneficial	May Impact	May Impact
Mesic-Wet Flatwoods	May Impact	Beneficial	May Impact	Beneficial	May Impact	May Impact
Strands, Cypress Ponds, Swamps	No Impact					
Savannas, Bogs, Seepage Slopes	No Impact					
Pond, Lake Margins	No Impact					
Aquatic	No Impact					
Slope, Hardwood Forest	No Impact					
Bluffs	No Impact					
River/Streambanks	No Impact					
Floodplains	May Impact	Beneficial	May Impact	Beneficial	No Impact	No Impact

\* US Fish and Wildlife Service Endangered or Threatened

CUM = cumulative, over the long term

## Vegetation:

**Existing Condition:** Forests are the dominant land use in Florida. They cover almost ½ of Florida's 34 million acres. Most of Florida's forests are in private ownership. Within the project area there are approximately 516 acres of pine stands ranging from 27 to 39 years old (See Table 9), interspersed with hardwood and mixed pine/hardwood swamps and stream buffers. These stands were field inventoried in the 2006. The inventory followed the objectives set forth in Forest Service Handbook 2409.26d - Region 8 Silvicultural Examination and Prescription handbook.

Random variable radius plots were taken with a 10-factor prism in all stands proposed for treatment. Data obtained from these plots included such items as basal area, tree diameter and height, tree age, understory composition, and the presence of gopher tortoise. This data was also taken for stands not proposed for treatment but needed for RCW forage analysis.

A description of the understory and groundcover are described in Table 11 below.

**Table 11. Understory Vegetation Types in Bradwell Game Farm Analysis Area**

Understory Type	Acres
Non Forest or Not Recorded	
Scrub Oak	
Wiregrass	
Palmetto	
Mixed grasses, including bahia	25
Mesic Hardwoods	516
Gallberry, Wax myrtle, Fetterbush	881
Titi	
Flat or Prairie	
Total	1422

Summarizing the botanical and silvicultural inventories, all stands proposed for activity in this project occur on mesic to somewhat xeric flatwoods. Stands to be treated younger planted slash pine (*Pinus elliottii*) and loblolly pine (*Pinus taeda*). The understory is mainly composed of gallberry, fetterbush, titi, wax myrtle, sparkleberry, sweetbay, huckleberry, or holly. The groundcover can be a combination of wiregrass, bahia grass, runner oak, broomsedge, or various other grasses and forbs. Surrounding the pine flatwoods are swamps, low areas, and natural drainages that contain bottomland hardwoods. Between the pine ridges and bottomlands are usually a gently sloping, wet flatwoods ecotone. These areas are characterized by a sparse overstory of pine with either thick, shrubby understory and very sparse groundcover, or a sparse understory and dense groundcover of hydrophytic herbs and shrubs. There are existing roads and travel ways that cross these areas and through the bottomlands.

**Table 12. Ageclass Distribution by Forest Type for Bradwell Game Farm Analysis Area**

Sum of Ac	Ageclass (Years old)											Grand Total
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	100-110+	
Non-Forest	25											25
Southern Red Oak - Loblolly								183				183
Slash Pine			149									149
Loblolly Pine			72	112								184
Bottomland Hardwood - Yellow Pine												
Baldcypress - Water Tupelo												
Sweet Bay - Swamp Tupelo - Red Maple											881	881
Grand Total	25		221	112				183			881	1422
Percent of Total	1.7%		15.5%	7.8%				12.9%			62%	100%

Past forestry practices that have affected the vegetation in the project area include planting slash pine on xeric sites (off-site slash pine), planting slash pine plantations on mesic flatwoods, prescribed burning, and fireline plowing. Based on visual observations, some of the effects of past practices are still evident, including firelines that encircle some plantations and impede the fire regime, and some stunted off-site slash pine. There are

several stands that were cut over and not replanted in the 1930's. These are now very dense stands of laurel oak and sparkleberry, with scattered loblolly.

Most of the pine plantations in this analysis area are growing rapidly and the crowns of the trees in these stands are closing in and beginning to shade out the understory vegetation. The basal area ranges from 104 ft<sup>2</sup> to 134 ft<sup>2</sup>/acre in the young slash pine plantations. The immature loblolly pine stands are characterized by a dense to very dense condition with a range of basal areas of 70 to 162 ft<sup>2</sup>/acre across the analysis area.

All of the pine stands in the analysis area are currently being managed under even-aged management.

Some Old Growth stands, as designated by the forest plan, are within the analysis area (See Table 10, below).

**Table 13. Designated Old Growth Stands within Bradwell Game Farm Analysis Area**

Old Growth Type	Forest Type	Birth Day	Acres	Comp	Stands	DFC
Bottomland Hardwood	68	1900	819	113	1	5.1
Bottomland Hardwood	68	1900	3	113	28	5.1
Bottomland Hardwood	68	1900	44	113	29	5.1

This old-growth stands were designated for the whole forest according to the guidance provided in Forestry Report R8-FR 62 at the projected acreages for individual management area (described in the Forest Plan on page 2-6). Many of the designated stands do not meet the old growth parameters in the report, but these stands were designated because these were the oldest stands and most likely to achieve the old-growth parameters first. None of these old growth stands are proposed for treatment in alternatives A or B.

There is one known patch of Lygodium, an invasive exotic plant species within the analysis area along Carl Bradwell Road. As a mitigation measure to reduce the risk of infection, timber sale contracts contain a mandatory clause BT6.35 (Equipment Cleaning) to prevent the introduction of exotic plants.

#### **Environmental Effects:**

During harvesting operations of alternatives A or B, selected trees would be removed from the stands where thinning, removal cuts, or clear cutting harvest methods are used. During these operations some brush and understory vegetation would be bent over and crushed. Removal of biomass would not exceed the amount necessary for nutrient cycling.

Thinning from below would reduce the basal area of selected stands to the target amount, which is generally 50 ft<sup>2</sup>/acre by removing trees in the mid to lower diameter classes in the individual stands. The removal of pine trees would reduce the amount of pine needle litter that falls to the forest floor. Pine straw is one of the fuel types that provide continuity across a forest stand allowing fire to spread evenly. It has been determined by our fuels specialist and a biologist that this pine straw reduction would not cause a reduction in our ability to prescribe burn these stands.

Harvesting operations, such as thinning, removal cuts, and clearcutting pose a risk of direct mortality to sensitive plant species if present, but the benefit to the population as a whole would be positive. Thinning would open up the overstory of these stands allowing more sunlight to reach the forest floor, improving habitat for understory plants.

Thinning reduces the competition between residual trees for sunlight, moisture, and nutrients, causing an increase in radial growth. Trees and vegetation in and immediately adjacent to the stands to be thinned would be affected by the reduced competition. Trees, hardwood brush and herbaceous vegetation would all respond to the increase of sunlight, moisture, and nutrients.

The combination of removing selected trees and prescribed burning would have a beneficial effect on these stands. Thinning or selecting groups of trees would allow more sunlight to reach the forest floor, which could cause more hardwood brush to grow. Timely prescribed burns after the harvest operations would knock back or top kill the hardwood brush reducing the chances of its encroachment. The long-term cumulative effect of these actions would be to reduce the woody component of the understory and increase the habitat for herbaceous vegetation adapted to frequent fires.

Alternatives A and B prescribe the clearcutting method to remove the off-site slash pine in stand 5. Clearcutting is the optimal cutting method to be used for restoration of these stands back to longleaf pine. Longleaf is the species of pine, which naturally grew on this site as recognized by the forest plan and the soils. None of the other cutting methods such as shelterwood with reserves would be appropriate because there are no longleaf pine trees on this site to act as seed sources for natural regeneration.

A recent study on the Osceola National forests analysed the effects of removing biomass from pine plantations. This study will soon be presented to the Society of American Foresters, entitled "The Evaluation of Two Round Baling Systems for Harvesting Understory Biomass" authored by Loensi Do Canto, Juliana; Klepac, John; Rummer, Bob, Savoie, Phille; and Seixas, Fernando.

**Alternative A** - Site preparation for tree planting would be accomplished by using Triclopyr as a hack and squirt and cut stump treatment. In very sandy areas where there is not significant slope, an alternate method is by applying the herbicide hexazinone on a 6-foot by 6-foot grid over the area. The application rate for Hexazinone is approximately 3 quarts per acre or 5 ml of 50% dilute mixture with water per spot. The prescribed rate is less than the application rate approved on the manufactures label and is consistent with the recommendations in the Vegetative Management EIS for the Coastal Plain/Piedmont. The use of the herbicide hexazinone and/or Triclopyr was prescribed in alternative A because of the amount and size of woody stems in the stands to be planted. Prescribed fire alone would not be enough site preparation for tree planting. These herbicides are considered low in toxicity and approved for site preparation use in Florida.

A description of Hexazinone and/or Triclopyr and its environmental effects on vegetation is described in detail in the Environmental Assessment for Vegetation Management in the Coastal Plain/Piedmont (chapter IV, pages 46-50).

Some vegetation would be cleared along the edges of the roads to be reconstructed.

It is unlikely that the actions prescribed in this alternative could cause the demise of any rare or endangered plant or animal species including herbaceous wildflowers.

**Alternative B** - the main effects on vegetation would be from thinning, and using hand tools for site preparation. The effects of thinning and road reconstruction and maintenance would be the same as alternative A.

The potential effects of using hand tools only on the vegetation would be to cut the vegetation and leave it. This would kill only a very small portion of the vegetation on these sites. Several studies have revealed that using hand tools on sites that have a strong woody component causes the stumps to sprout vigorously, requiring frequent retreatment. It also multiplies the number of stems to be treated with each follow-up treatment.

A description of hand tool site preparation and its environmental effects on vegetation are described in the Environmental Assessment for Vegetation Management in the Coastal Plain/Piedmont (chapter IV, page 52).

In Alternatives A and B tree planting would be accomplished by hand planting containerized longleaf pine seedlings at a spacing of 6 by 12 feet or 605 trees per acre. These seedlings would be from a north Florida genetic seed source.

**Alternative C** - The only action in alternative C that would affect vegetation is prescribed burning. The burning prescribed in alternative C would be done primarily in the winter months of the year with the objective of reducing the amount of fuel on the forest floor. Winter burning does not kill as much woody vegetation as growing season burning. So a cumulative effect of burning in the winter months only would be to allow the encroachment of woody vegetation into these fire dependent communities. This encroachment of woody vegetation would eventually change and reduce the plant diversity of the community.

Mitigation measures imposed to help reduce potential environmental impacts of herbicide application:

- *The guidelines for planning and applying herbicides contained in the Vegetation Management Environmental Impact Statement would be followed (Veg. Mgmt. FEIS 1989)*
- *An Emergency Spill Plan would be developed to minimize hazards to people and natural resources in the event of an accident.*

The following mitigation measure would apply to alternatives A and B to reduce the chance of spreading exotic plants:

- *Timber sale contracts contain a mandatory clause BT6.35 (Equipment Cleaning) to prevent the introduction of exotic plants.*

## Cumulative Effects on Biological Resources

Some of the past, present and future management activities on ANF lands in the analysis area, in combination with the proposed alternatives, would have cumulative effects on the vegetation and wildlife in the analysis area.

The cumulative effects of past vegetation management activities have resulted in an unmanaged forest, prior to the land being acquired by the Forest Service in 1994. The lack of prescribed burning has made the forest what is today. Even though some vegetation is now in rows the functioning of the ecosystems in the analysis appear to be normal. Future thinning operations in the plantations with rows would eventually reduce the appearance of rows.

For alternatives A and B it is reasonably foreseeable that additional harvests would be made in these stands. It is predicted that these stands would need additional thinning and/or uneven-aged treatments on a fifteen to twenty year cycle. As the trees in these stands continue to grow in size the basal area they occupy will also increase making it necessary to remove additional trees to move the stand toward an open park-like condition. The cumulative impacts from future thinning or uneven-aged treatments are not expected to be significant.

For alternative C, the cumulative effects of not thinning the stands would be the loss of potential wood fiber production. Under normal timber management weak, diseased, and suppressed trees are removed from the forest before they die. Under this alternative, mortality would not be captured and the wood fiber in those trees would be lost. The trees that died from over crowding and shading would eventually fall to the forest floor and be consumed by prescribed fire or decay. Loblolly in particular is susceptible to southern pine beetle when in an overstocked condition.

The condition of the vegetation in the analysis area is highly a result of past management activities. Native Americans were the first humans to have an impact on the vegetation, and human impacts have continued up to the present day. Timber harvesting and reforestation activities in the twentieth century had a significant effect on the composition of stands, including species, age and density, and some of these effects, such as the presence off-site slash pine stands and dense young plantations, are very obvious today. Older stands have a more “natural” appearance, but these stands are also a result of past management, including timber harvesting and turpentine gathering. All alternatives including the no action alternative would impact vegetation in some manner. The resulting forest condition would be a cumulative effect of the currently proposed actions in combination with past management actions.

Present, on-going management activities in the analysis area include prescribed burning all of the upland areas within the analysis area.

The analysis area is scheduled for prescribed burning approximately once every three years. Prescribed burning, in combination with Alternatives A and B would have a cumulative effect on vegetation in the analysis area. Prescribed burns kill, scorch and consume vegetation, particularly understory and groundcover vegetation. Combining prescribed burning with herbicide treatment would result in a positive cumulative effect of reducing woody vegetation such as laurel oak and sparkleberry, and increasing desirable groundcover vegetation such as wiregrass. Reducing woody vegetation would also improve growing conditions for planted longleaf pine seedlings. Prescribed burns occasionally kill individual overstory trees or small patches of overstory trees, where hotspots occur. Prescribed burning would have a net beneficial cumulative effect on wildlife in the analysis area by mimicking the habitat conditions under which the wildlife evolved.

Future management activities in the analysis area should include continued prescribed burning, the cumulative effects of which have been previously discussed. Future management would also likely include timber harvesting. Even-aged stands may be treated to convert them to uneven-aged stands. It is unlikely that timber harvesting would be proposed again in this analysis area for at least ten years, unless unforeseen events draw attention to this area sooner. It is not anticipated that there would be a cumulative effect from the proposed alternatives in combination with future timber harvesting because their effects of each would not overlap in time. If the current management direction continues into the future, expected beneficial cumulative effects would include additional off-site slash and loblolly/laurel oak conversion to longleaf pine and additional reduction in the density of pine plantations, both of which would have positive effects on wildlife in the analysis area.

In addition to the cumulative effects of past, present and future management activities, the analysis area could be affected by activities on adjacent lands. Private land adjacent to the analysis area varies from developed to undeveloped. Some of the undeveloped land is currently for sale, and development is expected to increase in this area due to its proximity to the National Forest, Lake Talquin and the Ochlockonee River. As this area continues to develop, native vegetation would likely be removed and non-native vegetation may be added. The probability of non-native vegetation becoming established on the ANF may increase. The analysis area would likely become increasingly important for providing habitat for biological resources.

## Socio-Economic Effects

### Visual Quality:

**Existing Condition:** The visual quality objectives of the analysis area range from maximum modification to partial retention. These designations are based on distances from points of interest, such as developed recreation areas, heavy traveled recreation roads, or wilderness areas. This compartment has not been mapped for visual quality objectives, so the landscape architect will assist in stand layout prior to implementation.

**Environmental Effects:** The major impacts on the visual appearance of the area would be from timber harvesting and restoration activities proposed.

During the timber harvesting operations in alternatives A or B some vegetation and brush would be bent over and crushed as trees are removed from these stands causing some browning of vegetation. Treetops or logging slash not removed from the stand would also turn brown. The burning in the growing season would cause vegetation to appear brown for a longer period of time than winter burning. This is because the deciduous trees do not have their leaves during the winter.

Slash treatment zones would be required in several stands in which all logging debris within 50 feet of state highways would be lopped and scattered within 2 feet of the ground. These zones would help mitigate the adverse effect of thinning or clearcutting next to main travel/viewing corridors.

The following mitigation measure would be applied to alternatives A and B to reduce the visual effect of the proposed actions:

- *Establish slash treatment zones when harvest areas are adjacent State Highway 20.*
- *Locate landings away from State Highway 20 in thinning stands.*
- *Utilize clumps of vegetation to break up the appearance of the clearcut in unit 5. The Division of Forestry has done extensive restoration using clearcuts to the east on SH 20. They have done public education with signage, so this will help mitigate public concern over clearcutting.*

Some of the thinning prescribed in alternatives A and B would remove every second row as a skid row. Removing these rows would increase the linear appearance of these stands making the rows more noticeable. In several stands thinning occurs in areas which will be thinned from below. In these cases, skid rows would be made approximately every 70 feet for tree removal. This would also increase the linear appearance of these stands.

One beneficial effect of thinning would be to open up these stands, which would increase the sight distance and increase the chances of viewing wildlife.

Browning of vegetation would occur about two or three weeks after the herbicide application for site preparation. The brown leaves would remain on some branches until the winter months, at which time they should fall off.

In Alternative B, hand tool site preparation in the restoration areas would flatten the remaining brush and smaller hardwood trees making the area appear larger and open up the sight distance in this stand.

In all alternatives, prescribed burning operations would cause a temporary browning of the vegetation and may leave burn scars on the base of the trees. Prescribed burning would improve visibility for people traversing through the woods by controlling the understory vegetation, keeping the woods more open and controlling the amount of fuel load. The effects of prescribed fire on visual quality are also described in the Final Environmental Impact Statement prepared for Vegetation Management in the Coastal Plain\Piedmont Volume 1, Page IV-116.

The cumulative effects of alternative C on visual resources would result in a thicker more dense forest, reducing the sight distance within the forest. These stands of trees are traditionally pine communities where an open understory is desired for the human/social benefits of the ecosystem.

## Recreation:

**Existing Condition:** The recreation opportunities that are available to the public in this analysis area include, but are not limited to, bird watching, canoeing, hunting, hiking, fishing, camping, viewing nature, and recreational driving.

**Environmental Effects:** Alternative A and B would temporarily detract from the "natural setting and serenity" of the area. Restoration cuts, reproduction openings, log landings, and the thinning of the pine overstory would encourage growth and blooming of the groundcover vegetation. Some of the under- and mid-story vegetation would be removed, improving sight distance. Hunter success could be improved with an open understory and improved access. Temporary detractions of logging equipment could be offset by visually appealing, open, park-like stands. Logging traffic would temporarily increase along recreation area travel routes. Wildlife viewing and hunter success may be reduced for a short time due to logging activities. The over-all desired future condition of the forest in an open park-like condition would be beneficial over the long term.

The addition of a mixed use trail system, kiosks, and a primitive canoe launch will have a beneficial impact on the recreational users. The south terminus of FR 194 is also a very popular fishing area.

The interaction with the haul routes for the timber sale may cause a temporary adverse effect on recreational users if they are present when logging operations are in progress. The timber sale operator's truck drivers would be notified to watch out for any users in the area during the timber sale and on haul routes.

The proposed treatments may have a temporary adverse effect on the quality of the user's recreational experience in the areas of proposed silvicultural treatments. The desired set of experiences offered in these areas or adjacent to them is classified as Roded Natural in the Recreation Opportunity Spectrum (ROS).

Roaded Natural classification has probability to experience some affiliation with other types of activities more common to the recreation experience but does not imply that management techniques would not be seen or heard. This spectrum is a USDA Forest Service management approach for recognizing possible combinations of recreation activities, settings and probable experience opportunities. This temporary effect cannot be avoided with this alternative.

Thinning and prescribed burning would be beneficial to many forms of recreation, due to easier access through the stands.

There should be no cumulative effects of this alternative on recreation opportunities unless a new form of recreation is developed that is incompatible with these actions.

Mitigation Measures for alternatives A and B which reduce the potential impact on recreation values are:

- *Establish slash treatment zones when harvest areas are adjacent to State Highway 20.*

Alternative C would allow natural processes to continue, including canopy crown closure and suppression of the groundcover. Without thinning the young pine plantations would become thicker and more shaded. The recreation experience would be decreased over time and the forest composition and character would change to a thicker denser brushy understory. Hunting and viewing wildlife would also decline as the stands become denser and it becomes more difficult to see wildlife.

## **Cultural Resources:**

**Existing Condition:** All stands and roads proposed for treatments were inventoried for cultural and heritage resources during the summer of 2009. There were several previously known cultural resource sites in the area, and 11 new sites were found during these surveys. The recommendation of the Forest Archeologist, with concurrence by the State Historic Preservation Officer and Tribal Historic Preservation Officers, was to avoid these sites and proceed with the proposed actions. To avoid the sites, the stand boundaries or individual sections of the stands would be painted out and avoided during the operations.

**Environmental Effects:** Alternative A and B are not likely to have an effect on cultural or historical resources. There is still potential to affect undiscovered sites, but this potential is low, because stands that had a high probability for cultural resources were intensively surveyed.

These alternatives would not have an adverse cumulative impact on or historical resources. Surveys have been completed for areas where ground-disturbing activities are prescribed and known sites would be avoided. The surveys completed have added to our knowledge about cultural resources.

The following mitigation measures for cultural resource protection would be applied to alternatives A and B:

- *Known cultural resource sites would be designated on the Sale Area Map and painted in white. These areas would be avoided during ground-disturbing activities.*
- *Road segments designated by the Forest Archeologist would not be graded, ditched, or otherwise disturbed. Fill material may be placed on these sections.*
- *If any new sites were discovered, work would stop until the site is surveyed and mitigated by the Forest Archeologist.*

Alternative C would have no effect on cultural resources. There would be no opportunity to locate presently unknown sites within the project area.

## Economics:

**Existing Condition:** The proposed project would take place in the northeast portion of Liberty County. Many of its residents work for state or government agencies in the Tallahassee area. This county is a rural community. Many of its residents work for state or government agencies in the Bristol or Blountstown. Approximately thirty percent of the U.S. Census Bureau labor force income generated in the county is directly or indirectly associated with forest products (University of Florida, Forestry in Florida and Liberty County and U.S. Census Bureau). The sale and harvesting of timber on the Apalachicola National Forest historically produced funds, a portion of which was returned to the county in lieu of taxes to be used for schools and roads. On October 30, 2000 the president signed the Secure Rural Schools and Community Self-Determinations Act of 2000 (Public Law 106-393). This legislation ends rural communities' historic dependence on National Forest receipts to finance school and road construction. Under this act, affected counties in the National Forests in Florida elected to receive their share of the average of the three highest 25 percent payments made to the state during the period FY 1986 through FY 1999. This payment plan will continue through the year 2011.

**Environmental Effects:** Alternatives A and B would offer pine sawtimber and pulpwood products for sale and perform maintenance and reconstruction work on forest system roads. The table below compares these action alternatives from a financial standpoint, using preliminary cruise data and fiscal year 2010, 1st quarter base prices. The actual revenue generated by a timber sale would be computed using final cruise data, bid prices, and costs current at the time of the sale. This is a very simple economic analysis comparing values of tangible items. There are several intangible items such as recreation opportunities, people's value judgments, or how many more people would use a road because it is reconstructed. These types of values are speculative at best and are not included in this analysis.

The net value of alternative A and B would produce a mixture of sawtimber and pulpwood for the local timber market. These alternatives have a positive net value when compared to the outputs of the no action alternative.

Alternative C would not contribute to the economy of Liberty or surrounding counties in the form of revenues and the cost of the normal prescribe burning and road maintenance would cause this alternative to have a negative net value.

**Table 14. Economic Analysis**

Base Year 2010  
 Inflation Rate 0.022

				Alternative A		Alternative B		Alternative C	
<b>Revenues:</b>			Year	Units	Inflated	Units	Inflated	Units	Inflated
Product	Units	Value/Unit	Planned	Planned	Benefits	Planned	Benefits	Planned	Benefits
Sawtimber	CCF	81.3	2010	767	62,357	767	62,357		0
Pulpwood	CCF	29.74	2010	2,147	63,852	2,147	63,852		0
Total				2,914	126,209	2,914	126,209	0	0

				Alternative A		Alternative B		Alternative C	
<b>Costs:</b>			Year	Units	Inflated	Units	Inflated	Units	Inflated
Action	Units	Cost/Unit	Planned	Planned	Costs	Planned	Costs	Planned	Costs
Sale Preparation (Appropriated)	CCF	\$4.50	2010	3,025	13,613	3,025	13,613	0	0
Road Reconst. FR 194	Miles	\$11,744.97	2010	1.49	17,500	1.49	17,500	0	0
Road Reconst. FR 194 B	Miles	\$6,000.00	2010	0.50	3,000	0.50	3,000	0	0
Road Reconst. FR 194 D	Miles	\$20,000.00	2010	0.50	10,000	0.50	10,000	0	0
Road Reconst. FR 194 E	Miles	\$6,666.67	2010	0.45	3,000	0.45	3,000	0	0
Plant Longleaf (CC)	Acre	\$471.86	2013	67	33,747	67	33,747	0	0
1st Year Check (CC)	Acre	\$15.00	2014	67	1,096	67	1,096	0	0
3rd Year Check (CC)	Acre	\$15.00	2016	67	1,145	67	1,145	0	0
<b>Sale Summary:</b>			Total		69,489		69,489		0

Action	Units	Calculation		Alternative A	Alternative B	Alternative C
Benefits	Dollars	Total Revenues		126,209	126,209	0
Total Road Costs	Dollars			33,500	33,500	0
Sale Value after Road Costs	Dollars			92,709	92,709	0
Roads and Trail	Dollars	10% of Revenues		12,621	12,621	0
Return to County	Dollars	25% of Revenues		17,372	17,372	0
Action Costs	Dollars	Total Costs		69,489	69,489	0
Sale Net Worth	Dollars			26,727	26,727	0

**KV or grant funded work:**

Site Prep Velpar (CC)	Acre	\$249.55	2012	67	17,464	0	0	0	0
Site Prep Handtool (CC)	Acre	\$260.97	2012	0	0	67	18,263	0	0
Site Prep Burn (CC)	Acre	\$29.89	2012	67	2,092	67	2,092	0	0
Plant Wiregrass	Acre	\$1,235.31	2012	67	86,448	67	86,448	0	0
Longleaf Release Herbicide	Acre	\$342.81	2014	67	25,057	0	0	0	0
Longleaf Release Handtools	Acre	\$360.00	2014	0	0	67	26,314	0	0
Mechanical Fuel Reduction	Acre	\$245.62	2011		0		0	0	0
RCW Inserts	Each	\$435.97	2011		0		0	0	0
(GC) Removal (Triclopyr)	Acre	\$435.97	2011		0		0	0	0
(GC) Removal Handtools	Acre	\$435.97	2011	0	0		0	0	0
Midstory Removal Herbicide	Acre	\$244.74	2011		0		0	0	0
Midstory Removal Handtools	Acre	\$302.00	2011	0	0		0	0	0
(CC) Clearcut					131,060		133,116	ed Costs	0
(NS) Non-stocked					200,549		202,605	ernative	0
(GC) Groundcover									

If we apply the IMPLAN response coefficients used in the EIS for the revised forest plan (EIS page B-65) the following table of impacts to jobs and income could be displayed for each alternative. It should be noted that the coefficients in the forest plan were for a ten-year planning period and have been divided by 10 for this calculation.

**Table 15. Revenue and Jobs Created by Alternatives**

This spreadsheet uses the coefficients in table B7 from the EIS on the Forest Plan to determine the number of Jobs and income generated by the timber produced in individual alternatives.

Base Year 2010  
 Inflation Rate 0.04

**Revenues:**

Product	Units	Value/Unit	Year Planned	Alternative A		Alternative B		Alternative C	
				Units Planned	Benefits	Units Planned	Benefits	Units Planned	Benefits
Sawtimber	CCF	76.00	2010	2147.00	\$163,172	2147.00	\$163,172	0.00	\$0
Pulpwood	CCF	30.00	2010	767.00	\$23,010	767.00	\$23,010	0.00	\$0
<b>Total</b>				<b>2914.00</b>	<b>\$186,182</b>	<b>2914.00</b>	<b>\$186,182</b>	<b>0.00</b>	<b>\$0</b>

Action	Units	Value/Unit	Year Planned	Alternative A		Alternative B		Alternative C	
				Units Planned	Jobs	Units Planned	Jobs	Units Planned	Jobs
Jobs from Sawtimber	M MCF	9.35	2010	0.21	2.01	0.21	2.01	0.00	0.00
Jobs from Pulpwood	M MCF	11.31	2010	0.08	0.87	0.08	0.87	0.00	0.00
<b>Total Jobs</b>					<b>2.87</b>		<b>2.87</b>		<b>0.00</b>

Action	Units	Value/Unit	Year Planned	Alternative A		Alternative B		Alternative C	
				Units Planned	Dollars	Units Planned	Dollars	Units Planned	Dollars
Income from Sawtimber	M MCF	0.37	2010	0.21	0.08	0.21	0.08	0.00	0.00
Income from Pulpwood	M MCF	0.43	2010	0.08	0.03	0.08	0.03	0.00	0.00
<b>Total Income MM\$</b>					<b>0.11</b>		<b>0.11</b>		<b>0.00</b>

<b>Total Income \$</b>				<b>\$112,696.00</b>	<b>\$112,696.00</b>	<b>\$0.00</b>
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## Environmental Justice and Civil Rights Impact Analysis:

**Existing Condition:** Demographics of the Bradwell Game Farm Analysis Area were reported in the year 2008 US Census for Liberty County. According to the census, Liberty County had a population in 2008 of 7957. Approximately 78 % of the population was listed as White, 19 % Black or African American, 6 % Hispanic or Latino, 2 % Native American, and 1 % reporting two or more races.

**Environmental Effects:** All alternatives rate the same for this subject area. None of the actions proposed by any of the alternatives should have any negative affects on the Civil Rights of the citizens of Liberty County or the surrounding area. No minorities would be discriminated against because of the proposed actions in these alternatives. No groups of people would be disproportionately affected as a consequence of the proposed action.

All labor contracts generated from the proposed action would have clauses, which prohibit discrimination for any reason. There are no foreseeable changes in the management of the forest or surrounding private lands that would adversely affect the Civil Rights of people in the future.

## Transportation System

**Existing Condition:** There are approximately 5.0 miles of system roads in the Bradwell Game Farm analysis area. A new trail is planned in the analysis area, as shown in Figure 2. These roads and trails are maintained at different maintenance levels. The road (FR 194) that provides access to the public is of a native surface material. The administrative use roads are only maintained if a problem such as erosion occurs.

**Table 16. Miles of Road by Traffic Service Level**

Description	Traffic Service Level	Maintenance Level	Miles
Paved Road	A	5	
Major graded Road	B	4	
Graded Road	C	3	1.5
Admin. Roads	D	2	3.5
Obliterated Roads	O	1	0.1
	Total		5.0

### Road Analysis Review

The ANF previously conducted a forest-wide Road Analysis Review of the transportation system for the forest. The Road Analysis Review produced maps identifying which roads the ANF needs in order to effectively manage the forest, and which roads are unnecessary for managing the forest and therefore should be closed. The review identified one existing system roads in the Bradwell Game Farm that is open to public use, FR 194 which is a maintenance level 3 road. A site-specific analysis determined that there are several existing maintenance level 2 roads which need to be retained for administrative use. These are shown in figure 2 and include FR 194A, FR 194B, FR 194C, FR194D, FR 194E and FR 194F. During the sale, .5 miles of temporary roads will be used to access the landing, and will be closed when the unit is completed. There is 0.1 miles of obliterated road.

**Environmental Effects:** Alternative A and B would impact the road system of the analysis area the same. These alternatives are proposing to maintain about miles of road and reconstruct approximately 3. miles of roads. Alternatives A and B would reconstruct several of the main arteries that travel through the area making public access safer while protecting the environment.

Under alternative C (the no action alternative) only FR 194 in the analysis area would be maintained.

## Cumulative Socio-Economic Effects

Some of the past, present, and future management activities on ANF lands in the analysis area, in combination with the proposed alternatives, would have cumulative effects on scenic quality and recreation opportunities in the analysis area.

The forest is a dynamic place, always changing from day to day, and so are its visual resources. Looking into the future, the visual resources would change as the forests are managed or not managed. What was once a young stand of trees would grow up to be a mature forest. Therefore, its visual appearance would change too. The cumulative affect of thinning and restoration activities would be to manage specific ecosystems in an open condition where visitors can easily see through the woods. This type of management may occur in areas that are traditionally longleaf pine or slash pine ecosystems. This type of management is desired according to the Revised Land and Resource Management Plan.

Past management activities including timber harvesting, site preparation prior to plantation establishment, and road building greatly altered the scenery and shaped the recreation opportunities available in the analysis area today. The proposed alternatives would temporarily alter the recreation opportunities in the analysis area, and the resulting scenery in the analysis area would be a short-term cumulative effect of the management of the analysis area over time.

Present, on-going management activities in the analysis area include prescribed burning all of the upland areas within the analysis area. The analysis area is scheduled for prescribed burning approximately once every three years. This compartment was most recently burned in February of 2009. Prescribed burning, in combination with the proposed alternatives, would have cumulative effects on scenery and recreation opportunities in the analysis area. Prescribed burns blacken and consume vegetation, greatly altering the scenery. Over time, prescribed burning increases sight-distance and maintain open stands by favoring groundcover over woody understory vegetation. The combination of prescribed burning and herbicide application would have a cumulative effect of increasing sight-distance and opening up stands that are currently choked with woody understory vegetation. This cumulative effect would also impact recreation opportunities in the analysis area. Recreation would be displaced from the analysis area while prescribed burns are conducted, but in the long-term, the combination of prescribed burning and the Proposed Action would have a beneficial cumulative effect on recreation by producing stands that contain native vegetation, a natural appearance, and understories that are open and accessible.

Future management activities in the analysis area will include continued prescribed burning, the cumulative effects of which have been previously discussed. Future management will also likely include timber harvesting. It is unlikely that timber harvesting would be proposed again in this analysis area for at least ten years, unless unforeseen events draw attention to this area sooner. Cumulative effects of the proposed alternatives in combination with future timber harvesting would depend upon the nature of the future harvests. If the current management direction continues into the future, expected cumulative effects would be similar to the effects of this proposal, and the quality of scenery and recreation opportunities in the analysis area would continue to improve.

In addition to the cumulative effects of past, present and future management activities, the recreation in the analysis area could be affected by activities on adjacent lands. Private land in Florida is becoming increasingly developed and the importance of the ANF as a source of natural scenery and outdoor recreation will likely increase.

The proposed alternatives would not have cumulative effects to cultural, historical resources in the analysis area, and would not have any adverse cumulative impact on the Civil Rights of any group. There would be no cumulative effects to the transportation system within the analysis area as a result of the proposed alternatives.

This project along with others that have been completed, are ongoing, or are likely to occur in the future on the ANF may slightly increase the per capita income in a sparsely populated county such as Liberty County. The cumulative effects on the per capita income in the other counties such as Leon County would be negligible. These counties do not have forestry-based economies although forestry still has a strong presence and the livelihood of some individuals does depend on a viable forest industry.

## Irreversible and Irrecoverable Commitment of Resources

The items described below are immediate or short-term effects the alternatives would have on the resources that cannot be replaced or regained.

Alternative A or B - The existing trees and vegetation that are thinned or crushed would be irreversibly lost. Once cut or killed this vegetation cannot be brought back to life. They would not be irretrievably lost, because the brush would re-sprout and more trees can be planted.

Some soil loss would occur from timber harvesting, road maintenance, and prescribe burning activities. The amount expected to be lost is well within the parameters established in the Forest Plan.

Alternative C - The timber volumes offered for wood processing plants would be lost for fiscal year 2010.

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## GLOSSARY

**Basal Area** - The cross-sectional area (square feet at 4½ feet above ground level) of trees occupying an acre of land. Basal area is used to measure the density of a stand of trees.

**Best management practice (BMP)** - A practice, or a combination of practices, that is determined to be the most effective and practical means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals.

**Fireline** - A linear barrier used to stop prescribed burns and wildfires by the removal or treatment of fuels. Firelines may include the use of mechanically plowed lines, water, retardants, etc.

**Off-site** - A term referring to species not normally found on a certain site under natural conditions. An off-site species may have been placed on the site or may have encroached on the site because of a change in natural conditions of the site.

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# **Appendix A**

## **Public Involvement**



Listed below are the comments generated from releasing the Draft EA for comments and how those comments were addressed in the EA or decision notice. The Comment period ran from \_\_\_\_\_ to \_\_\_\_\_ with the Draft EA being posted on the National Forests in Florida Web page at the following address:

<http://www.fs.fed.us/r8/florida/projects/documents/nepa/nepa.shtml>

Who Commented / Date Received	Issues, Concerns, and Opportunities	How Were the Comments addressed?
	1.	